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INTERVIEW WITH NATIVES AT MICKLEAN'S RIVER.

Chart of the Southern part of the
GREAT BARRIER REEF
including TORRES STRAIT, & adjacent coast of
NEW GUINEA
PART OF
AUSTRALIA
PART OF
NEW GUINEA
TORRES STRAIT

NARRATIVE

OF THE

SURVEYING VOYAGE OF H.M.S. FLY,

COMMANDED BY

CAPTAIN F. P. BLACKWOOD, R.N.

IN

TORRES STRAIT, NEW GUINEA, AND OTHER ISLANDS OF THE EASTERN ARCHIPELAGO,

DURING THE YEARS 1842–1846:

TOGETHER WITH

AN EXCURSION

INTO THE

INTERIOR OF THE EASTERN PART OF JAVA.

105837

BY

J. BEETE JUKES, M.A. F.G.S.

NATURALIST TO THE EXPEDITION,

AUTHOR OF "EXCURSIONS IN NEWFOUNDLAND."

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IN TWO VOLUMES.

VOL. I.

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1847.

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TO

CAPTAIN F. P. BLACKWOOD, R.N.

My dear Sir,

When you so kindly waived in my favour your privilege of publishing the narrative of our late voyage, I fear you expected from me a much better and more complete account than the one I now offer you. Such as it is, however, I beg you to accept it; and with it, my hearty thanks for the uninterrupted friendship with which you have honoured me from the commencement of our acquaintance to the present time. Whatever interest, or value, the following pages may possess, is in great measure owing to the facilities for exploration you were always so ready to afford me, whenever the nature of the service permitted it. In many of those little explorations, I had the pleasure of your society, and the advantage of your remarks; while I thank you for the one, the reader will often have reason to be grateful for the other.

More I forbear to add, except that I hope all your future voyages may be as agreeable and successful as the last, and that among your sincere well-wishers you will always number,

Your attached friend and shipmate,

J. BEETE JUKES.

London, June, 1847.

PREFACE.

When I first prepared this work for the press, I sought to make it a complete Journal of the Voyage of the Fly, from our departure in 1842 until our return to England in 1846. This design I subsequently abandoned, as I had no wish to repeat what might be already known, and no desire to re-describe scenes already familiar. That the purpose and the results of the Voyage might not, however, appear entirely unexplained, I have given a short narrative of these in the Appendix, and reserved for the more particular attention of my readers those portions only of my Journal which relate to places either hitherto imperfectly known, or of which, at least, no very recent accounts have been given to the public. These places are included between Sandy Cape on the N. E. coast of Australia, and the Strait of Malacca. I would add, that if it should seem I have apparently entered into too trifling details (more especially with reference to our intercourse with the natives), I have so done, not from any desire to extend my work, but because it appeared to me the only method of accurately conveying to the minds of others my own impressions, or of describing the manners, habits, social state, aspect, and condition, of the people and

the countries which we visited. No particular incidents, however, have been selected for effect, but as they occurred, and illustrated my subject, so were they related. I might possibly, by selection, have rendered them more striking, but their impression would then have been less real; in works of this nature, one line of plain fact is better than any heightened recollections, for the reader is apt to suspect the accuracy of details which are given apparently not because they are historical, but because they are amusing. For this reason, also, I have avoided all attempts at brilliancy, elegance, or graces of style, and endeavoured to relate with simplicity and fidelity whatever I had to tell, either of personal adventure, or of scientific research. With regard to the general arrangement of the work, it will be at once perceived that this is Geographical, and not Chronological. Taking them in the order of simple locality, along the coast of Australia, through Torres Strait, into the Indian Archipelago, I have described every place and its incidents as they were visited or as they occurred, but without regard to the particular period. Had I not adopted this plan, I must necessarily have indulged in much repetition. For as we frequently retraced our tracks, so for the mere purpose of chronological accuracy, I must have repeated my narrative, and have successively re-detailed events, possessing no necessary dependence on each other, and only separated by the mere lapse of time.

The illustrations now given consist of a few subjects selected from an extensive series of drawings made by Mr. Melville, who was attached to the expedition in the capacity of Artist, to whom I have to offer my acknowledgments not only for the use of the originals, but for his superintendence of their engraving. It is much to be regretted, that the expense of their production renders it impossible to hope for the publication of the remainder. A similar expression of obligation is due from me to Professor Owen, Dr. Latham, Mr. J. E. Gray, and Mr. Adam White, for the scientific contributions which the reader will find in the Appendix. Nor can I refuse myself the pleasure of publicly recording my thanks to the officers generally of the Fly and Bramble (and to my own messmates in particular), for the uniform kindness I received at their hands. Those only who belong to the navy can understand how inconvenient it is to have on board as an officer of the ship "one who knows nothing of the service," more especially one who, from the nature of his employment as a naturalist and collector, must be frequently liable to trespass against the discipline, or at least the established order, and etiquette of a man of war. Were it only for the forbearance shewn with respect to these occasional delinquencies, I should have every reason to be grateful; but the assistance and accommodation afforded me, the frank reception I met with, the unbroken social cordiality, and the steady friendship I

experienced, require a warmer acknowledgment, as being a far greater obligation. Nor ought I to omit all mention of the ships' companies of the Fly and Bramble. Of their good conduct as regards the service I am of course not entitled to speak, but their behaviour towards myself was always such as to demand my thanks.

I look back, indeed, with much satisfaction to the time spent on board the Fly, for I saw sufficient to confirm the generally admitted belief that manliness, open-heartedness, kindness, and sincerity, are not merely the proverbial attributes, but the real characteristics of the service to which I had the honour of being thus temporarily attached. Finally, as the voyage of the Fly and Bramble follows that of her Majesty's ship Beagle, executed under the command of Captain Stokes, in the years 1837—1843, so I trust it may be found to add to the information hitherto obtained upon countries of great interest, as connected with our own by the social ties of commerce: but still greater, when, as in the case of Australia, they are lands over which the feet of our countrymen now hurry for the purpose of "Discovery," but wherein their descendants may hereafter dwell the inhabitants of a great nation, the England of the New World, inheriting with the religion, the language, the laws, and the free institutions of the parent race.

CONTENTS OF VOL. I.

CHAPTER I.

PAGE

Capricorn Group—Structure of a Coral Island—Number of Birds and Turtle—One-tree Island—Heron Island—Wreck Island—Swain's Reefs—Gale of wind and dangerous anchorage—Number of Animals in a dead coral block—Anchor foul among coral rocks—Damage to Ship's bows 1

CHAPTER II.

Port Bowen—Boat cruise to its head—Walk to Shoalwater Bay—Interview with Natives—Friendly communication—Cruise in the pinnace to West Hill 22

CHAPTER III.

Cape Upstart—Geological structure—Pumice pebbles—Excursion to Cape Cleveland—Interview with Natives—Granite dyke—Excursion across Upstart Bay—Ascend Mangrove Inlet—Interview with Natives—Friendly demeanour—Excursion up Wickham River—Interview with Natives—Two tribes—Uproar at meeting—Friendly walk—Gentle manners—Return down river—Character of neighbouring country—Return to Ship—Leave Cape Upstart . . 52

CHAPTER IV.

Rockingham Bay—Gould Island—Mount Hinchinbrook—Passage into Halifax Bay—Range of hills on mainland—Streams of fresh water—Natives at first friendly afterwards hostile—List of Native words—Endeavour River—Geological structure—Lizard Island—Granitic pumice pebbles—Sleep on its summit—See our shadows in the fog—Commence the survey of the northern end of the Barrier Reefs—Cape Melville—Apparent friendship but treacherous attack of Natives—Aspect of reefs—Deep water outside—Land on Cape Direction—Treachery of Natives—Death of Bayley . . 90

CHAPTER V.

PAGE

Two wrecks on the Barrier—Appearance of Scurvy—Fall in with Merchantmen and supplies—Beauty of coral reefs—Grandeur of surf—Night scene from the wreck of the Martha Ridgway—Sir C. Hardy's Islands and Cape Grenville—Raine's Islet—Murray Islands—Mount Adolphus—Booby Island . . 115

CHAPTER VI.

Cape York—Native tombs—Evans' Bay—Hut and bundle of bones—Meeting with Natives—Their characters—Another party of a different tribe—Comatulæ—Method of preserving Echinodermata—Habits of Lingula—Possession Islands—Megapodius mounds—Port Libou—The N.W. Monsoon—Islands of Torres Strait—Geological structure—Turtle-backed Island—Migration of birds . . 136

CHAPTER VII.

Island of Oomāga—Interview with Natives—Damood—Interview with Natives—Their houses, gardens, water-holes—Curious pipe—Masseed—Interview with Natives—Old Garía—Houses—Curious carving of Bird and Fish—Darnley Island, or Erroob—Its aspect—Interview with Natives—Their houses, gardens, tortoise-shell masks, wigs, bows and arrows, drum, images, yams, tobacco, sugar-cane—Walk over the Island—Its volcanic origin—Height by Barometric Measurement—Numerals used by the people . . . 158

CHAPTER VIII.

The Murray Islands—Friendliness of the people—Purchase of skulls—Search after a "Barreet"—Geological structure of the Murray Islands, Erroob and Caedha—Volcanic origin—Second visit to Erroob—Way of using the bow—Doodegab's sisters—New Guinea, called Dowdee by the Erroobians—Names of places in Dowdee—Anchor off Bristow Island on the South Coast of New Guinea—Low muddy shore—Canoes—Mouth of a large river—A body of five hundred natives seen—Two boats sent away—Anchor under Bramble Key—Return to New Guinea Coast—Ship's cutter nearly swamped—Gale of wind—Anxiety for our boats—Aird's Hill . 195

CHAPTER IX.

Search after the missing boats—Cruise in the first gig—Enter a River—Interview with Natives at its mouth—Penetrate fifteen miles into

PAGE

the country—Meet a larger tribe, and see a large native house—Return—Shoot a "Cuscus"—Heavy rollers on the sand-banks off the mouth of the opening—Return to the ship—No news of the boats—Farther search for them—Skirmish with Natives—Return to Erroob 221

CHAPTER X.

Landing at Erroob—Excitement among the Natives—Visit Seewai, and bring him on board—Promises to accompany us, but dissuaded by his family—Drying a dead child—Seewai and Mammoos at war—Skirmish among the Natives—Some places said to be "Galla" (tabooed?)—Mammoos promises to accompany us, but backs out—Apparent dread of New Guinea—We resolve to return and lighten the Prince George, in order to take her into the rivers . . . 244

CHAPTER XI.

Take the Prince George into a river in lat 7° 50′—Large villages—Skirmish with the Natives—Land and examine an immense house—Bring off skulls and curiosities—Shoot two pigs—Proceed up river, but stopped by bad weather and shoal water—See other villages and many natives and canoes—Return to vessel—Damp character of country—Delta of large river—Best probable method of penetrating the interior of New Guinea 262

CHAPTER XII.

Last visit to Erroob—Seewai gives us news of our missing boats—Return to Cape York for water—Find intelligence of our missing boats at the Post-office at Booby Island—They have gone to Port Essington—Two wrecks happened recently, of which the crews and passengers are likewise gone to Port Essington—Notes on the importance of a post in Torres Strait 292

CHAPTER XIII.

Extent of the Barrier Reefs—The inner and outer routes—General features of an "individual coral reef"—Modes in which these reefs are grouped—The reefs of the Great Barrier divided into three kinds:—First, linear or barrier reefs; second, detached reefs; third, inner reefs—Form and extent of the Great Barrier Reefs—Likeness to a submarine fortification—Normal form of the Great Reef-mass—Variations from that form—The coral conglomerate and pumice pebbles of the North-east Coast of Australia—Structure of Raine's

PAGE

Islet—Singular mass of points above high-water mark—All prove stationary condition of North-east Coast for long period of time—Mr. Darwin's theory applied to the Great Barrier—Explanation through it of both the general form, the normal condition, and the occasional exceptions and variations 311

CHAPTER XIV.

First visit to Port Essington in August, 1843—General aspect of the country and settlement—Geological structure, sterility, unhealthiness—Native tribes—Second visit in September, 1844—Third visit in January, 1845—Arrival of a new party—Prahus collecting Trepang—Method of fishing for, and of preparing Trepang—Capabilities of Port Essington—Totally unfit for agricultural pursuits—No advantages for commerce—Inconveniently situated as a harbour of refuge—Fourth visit in June, 1845—Contrast between the vegetation of Port Essington and Cape York — Deaths among the new party — Political reasons for retaining Port Essington . . 349

CHAPTER XV.

Coupang, Timor—Aspect of country, and of the town—Money transactions—Refreshments—The church, school, and schoolmaster—Chinese—Malay Rajahs—Appearance of the people—Pirates—Aborigines—Church Service in Malay—Excursion up the valley—View of the interior—Geological structure—Raised coral reef . 367

CHAPTER XVI.

Aspect of the south-east end of Sandalwood Island—Alass Strait—Character of the shores of Sumbawa and Lombock—Lombock Peak—Approach to the Strait of Madura—Aspect of Madura and Java—Sourabaya, its extent and general aspect—Monetary affairs—Anecdotes of the people—Excursion to Grissek—Hire a house—Kindness of the Resident—Preparation for a Tour—Varied population of the town 389

LIST OF PLATES.

VOL. I.

Interview with Natives at Wickham's River . *Frontispiece.*
Lady Elliott's Island . . . . . *to face p.* 3
Granite Dyke 63
Raine's Islet . . . . . *to face* 126
Murray Islanders eager for Barter . . *to face* 133
Native Tombs 137
——————— on Cape York Island . . . 138
Natives of Cape York . . . . . *to face* 141
Native Tomb at Port Lihou 149
Natives of Masseed . . . . . *to face* 159
Native Pipe, Dalrymple Island 165
Carved Ornament, Masseed 168
Canoes off Erroob . . . . . *to face* 169
Drum from Erroob 176
Tortoise-shell Mask 178
Carved Image 185
Tortoise-shell Figure of a Boy 193
Treacherous Bay, Erroob . . . . *to face* 244
New Guinea House 273
Skull, Hatchet, and Drum . . . . *to face* 274
Cane Loop and Bamboo Scoop . . . 277
Section of Great Barrier Reef 333
Plan of Raine's Islet and Reef 338
Section of Western End of ditto 339
Victoria Square, Port Essington . . . *to face* 351

Chart of Great Barrier Reef.

VOYAGE OF THE FLY.

CHAPTER I.

CAPRICORN GROUP—STRUCTURE OF A CORAL ISLAND—NUMBER OF BIRDS AND TURTLE—ONE-TREE ISLAND—HERON ISLAND—WRECK ISLAND—SWAIN'S REEFS—GALE OF WIND AND DANGEROUS ANCHORAGE—NUMBER OF ANIMALS IN A DEAD CORAL BLOCK—ANCHOR FOUL AMONG CORAL ROCKS—DAMAGE TO SHIP'S BOWS.

On *Jan.* 7, 1843, I landed for the first time in my life on a coral island. This was a little islet called the First Bunker's Island, in the northern part of the Capricorn Group, which is an assemblage of islets and reefs on the north-east coast of Australia, having the 152° of longitude, and the tropic of Capricorn passing through them.

The beach was composed of coarse fragments of worn corals and shells, bleached by the weather. At the back of it a ridge of the same materials, four or five feet high, and as many yards across, com-

pletely encircled the island, which was not a quarter of a mile in diameter. Inside this regular ridge were some scattered heaps of the same stuff, the whole encircling a small sandy plain. The encircling ridge was occupied by a belt of small trees, while on the plain grew only a short scrubby vegetation, a foot or two in height. The materials of the encircling ridge were quite low and thinly covered with vegetable soil among the trees; but the sand of the central plain, which was dark brown, was sufficiently compact to be taken up in lumps, and a little underneath the surface it formed a kind of soft stone, with imbedded fragments of coral. Some vegetable soil also was found, a few inches in thickness in some places, the result of the decomposition of vegetable matter and birds' dung.

On the lee or north-west side of the island was a coral shoal or bank, sloping gradually off from low-water mark for about a quarter of a mile, when it was two or three fathoms under water. Immediately beyond this was a depth of fifteen fathoms. On the south-east, or weather side of the island, was a coral reef about two miles in diameter, having the form of a circle of breakers enclosing a shallow lagoon. Among the breakers, on the external edge of the reef, some large black rocks shewed themselves above water here and there all round. The lagoon inside was shoal, having two or three fathoms water occasionally over spaces of white sand, the rest being occupied by flats of dead and living coral,

To face page 3.

LADY ELLIOTT'S ISLAND, ONE OF THE CAPRICORN GROUP.

of which the former was left dry at low water. In this lagoon we saw both sharks and turtle swimming about, and there were upwards of thirty fine turtle turned this morning, when the boats first landed. The island was well stocked with birds, of which black noddies and shearwaters were the most abundant; the next in number being terns, gulls, white herons or ægrets, oyster-catchers, and curlews. The trees were loaded with the nests of the noddies, each of which was a small platform of sea-weed and earth, fixed in the fork of a branch. They had one rather elongated lightish brown egg, rather less than a hen's egg. The shearwaters burrowed in the ground two or three feet, their eggs were larger, rather pointed and speckled, and streaked with black. Under one tree I found a large green turtle either asleep or dying, as he would not move when I sat down on him, giving only a lazy flap with his hinder flipper occasionally. On the south side of the island, on the beach, were exposed some beds of pretty hard rock, formed of fragments of corals and shells, compacted together in a matrix of still smaller grains of the same material. The beds were thin and slab-like, and rose from out of the lagoon at an angle of about 8°, to a height of six or eight feet above high-water mark. Some of the finer slabs reminded me very much in general appearance of the slabs of the Dudley limestone. The colour of the rock was dark brown, hard externally, but the inside was white and much softer.

Jan. 9.—We sailed from the First Bunker's Island, and stood to the N.E. sounding. The depth for six or seven miles gradually increased to 40 fathoms, when we suddenly got no bottom with 100 fathoms, having passed over the edge of the bank of soundings which runs parallel to the coast hereabouts, from Sandy Cape to the northward. We then hauled in to the westward, passed by the third or Northern Bunker's Island, and anchored at night between it and a large oval reef with a shallow lagoon, and a small patch of dry sand on one part of its western rim. Sharks were very numerous here, and they attacked and bit the fly of the patent log as it trailed overboard.

Jan. 10.—After sounding outside again, and seeing more reefs and islands to the northward and westward, we anchored near one of them, which, from a single conspicuous tree on it, was called "One Tree Island."

Jan. 11.—Landed on this island, which exhibited the same general features as Bunker's first island, with some modifications. The external ridge of loose coral fragments was loftier and steeper, owing I believe to this island being rather more on the weather, or at least the south side of the reef. Inside, the island sloped down every way towards the centre, forming a shallow basin, in the middle of which was a small hole of salt water at or near the level of the sea. The inside slope was covered with low succulent plants, with pink flowers (me-

sembryanthemum ?) and low trailing bushes. On this green carpet were multitudes of young terns that fluttered before us like flocks of ducklings, with the old birds darting and screaming over our heads. In the single tree (which was in fact a small clump of the common pandanus of these seas, with its roots exposed above ground), was a large rude mass of old sticks, the nest of some bird of prey, probably the osprey. To the northward and eastward of the island stretched the shoal lagoon, its bottom of clean white sand and dark patches of dead and living coral, bounded by the usual rim of snow-white breakers. Just round the island, part of the body of the reef was now exposed at low water. This was a flat surface of about a quarter of a mile in width, dotted here and there with pools and holes of water. It consisted of a compact, tough, but rather soft and spongy rock, many loose slabs of which, two or three inches thick, were lying about. It was rather fine grained, and only here and there exhibited any organic structure or remains. There were no signs of living coral, except a few stunted specimens in some of the deeper holes of the reef, where also were some dead masses still standing in the position of growth. The whole was very different from my preconceived notions of a coral reef, and I erroneously imagined it must be an exception to their general character. It looked simply like a half drowned mass of dirty brown sandstone, on which a few stunted corals had taken root; and it

was not till a piece of the rock was broken open and its component parts minutely examined, that its purely calcareous nature and organic origin became evident. Under the loose slabs we procured a few cowries and other shells and some crabs, but altogether I confess I was much disappointed with the first view of a coral reef, both as to its beauty and richness in animal life. The most beautiful things were the hippopus and tridacna (chama gigas of old voyagers), that were every where lying about half buried in the rock; when their shells were open, and the mantle of the animal exposed, they were seen to be of rich velvety blues or greens spotted with black, or light brown spotted with yellow.

Jan. 12. — We were anchored a few miles farther to the N.W. in the centre of a group of reefs and islands, under one thickly wooded island that afterwards obtained the name of Heron Island. In attempting to land at low water, we were compelled to quit the boat soon after getting on the edge of the reef, and wade ashore a distance of a third of a mile. The bottom was very irregularly, but pretty equally divided between white sand and blocks of dead and living corals, principally the former. On many of the rough blocks of coral there was scarcely a few inches of water, and many large masses, particularly along the outer edge of the reef, were high and dry. All the sandy spots, however, were about three to four feet deep, and as neither the sandy spots nor the coral masses were

any where continuous for more than a yard or two, we had a succession of wading and scrambling that was rather laborious. Arrived at the island, the first thing that took my attention was a large developement of hard brown rock, like that on Bunker's Island. Both the island and the reef were elongated in an east and west direction, the island being half a mile long and not more than 300 yards broad. It consisted in the interior of piles of loose sand, covered by a dense wood of pretty large trees, with broadish leaves, most of which had a white brittle wood, and grew in a singularly slanting position, the stems frequently curving at an angle of 45°, although three or four feet in circumference. The beach of the island was steep, about twenty feet high at low water, and composed partly of sand and partly of stone. The sand was very coarse, composed wholly of large grains and small angular pieces of broken and comminuted corals and shells, with some larger worn fragments of both intermixed. The stone was of precisely the same materials, but very hard, and dark brown externally, although still white inside. It sometimes required two or three sharp blows with the hammer to break even a corner of it off. Its surface was every where rough, honeycombed, and uneven; the beds were from one to two feet in thickness, with occasionally in the fine-grained parts a tendency to split into slabs or flags. It was perfectly jointed by rather zig-zag points crossing each other at right angles, and splitting the

rock into quadrangular blocks of from one to two feet in the side. As far as external appearance and character went, it might have been taken for any old roughly stratified rock. As to position, the strike of the rock was parallel to the direction of the long diameter of the island and reef, or east and west; and it dipped on the north and south sides of the island to the north and south respectively, or from the island towards the reef at an angle of 8° or 10°. At the east end of the island it was not visible, but at the west it appeared from under the sand in two places, in one being horizontal, and in the other having a slight flexure or anticlinal line, which ranged also east and west. The rock was in many places much worn by the wash of the breakers, which had also a good deal undermined it in some places, and many blocks had fallen down in a line. The joints were parallel to the dip and strike respectively. The rise and fall of tide here was fourteen or fifteen feet, and at high water the upper part of the rock was just about covered; at low water the reef was dry for a small space all round the island. Now the question is, how or under what circumstances did the loose calcareous sand and fragments become hardened into solid stone, acquire a regular bedding and a jointed structure, and the planes of stratification assume an inclination of 8° or 10°. If it be supposed that a regular deposition on a slope of 8° took place every high tide, and a gradual and successive induration

went on, why does not the same thing take place now? or why did not the loose sand, which composes the greater part of the same beach, in the same position, become consolidated? Partial springs, containing carbonate of lime, are of course improbable in so small a heap of low sand as the islet is composed of. Either then the stratification and consolidation is the result of a gradual deposition beneath the level of low water, in which case a movement of elevation must have taken place, which in so small a spot seems a difficult and gratuitous hypothesis; or else the present structure must have been produced in *the interior* of a mass of loose sand by the infiltration of sea or rain water, or some other cause of which we are ignorant. I say in the interior, for had it been on the outside, what was to defend it from the wash of the sea that is now breaking down the hard solid rock, and shifting and washing backwards and forwards the loose sand of which the present beach is composed. After the interior of such a mass of sand had been consolidated, the loose exterior may have been washed away and the solid rock exposed. The speculation concerning the structure of this little island may seem a very unimportant circumstance even to the geologist; but it is not so, as this same rock is found along every beach and at every island near the coral reefs of Australia, and I believe in other parts of the world also.

Jan. 13 *to* 18.—The Fly, the Bramble, and the boats were engaged in surveying the group of

islands and reefs about, which, from the tropic of Capricorn running through them, have been called the Capricorn Group. The weather was very favourable, fine and clear, though very hot, as the sun was almost vertical. Turtle were very abundant, especially the green turtle, and loggerhead, but only one small hawk's-bill was taken. One night, Lieut. Shadwell,* being on one of the islands observing star altitudes, was actually obliged to place sentries round him to prevent the turtle from running over his artificial horizon as it lay on the ground.

Although there is not much variety, there is considerable beauty in a small coral reef when viewed from a ship's mast-head at a short distance in clear weather. A small island, with a white sand beach and a tuft of trees, is surrounded by a symmetrically oval space of shallow water of a bright grass green colour, enclosed by a ring of glittering surf, as white as snow, immediately outside of which is the rich dark blue of deep water. All the sea is perfectly clear from any mixture of sand or mud; even where it breaks on a sand beach, it retains its perfect purity, as the large grains of coral are heavy and do not break into mud, so that if a bucket full of coral sand be thrown into the sea, it may be seen gradually sinking like a white cloud without producing any discolouration in the surrounding water. It is this perfect clearness of the water which renders navigation among coral reefs at all practicable, as a shoal with even five fathoms water on it can be

* Now Commander Shadwell.

discerned at a mile distance from a ship's mast-head, in consequence of its greenish hue contrasting with the blue of deep water. In seven fathoms water the bottom can still be discerned on looking over the side of a boat, especially if it have patches of light-coloured sand; but in ten fathoms the depth of colour can scarcely be distinguished from the dark azure of the unfathomable ocean.

Sharks were very numerous and of great size and strength; one was hooked one day under the bows of the ship, and while in the water he was harpooned, pierced with a whale lance, and another very strong hook and line fastened in his jaws, but before a sufficiently large rope could be passed round his body to hoist him in by, he bent both the harpoon and the lance, disengaged himself from them and breaking both lines, got away. Many however were caught, remarkable for their great girth round the shoulders and capacity of mouth.

Jan. 18.—Landed with Captain Blackwood on Wreck Island. This was so named from part of an old wreck that lay on the reef, apparently of a vessel of 6 or 700 tons. The island was about a quarter of a mile long, and not more than 100 yards broad; a pile of sand covered by thick bushes. Its greatest length was in a N.N.E. and S.S.W. direction, and along each side of it ran sloping beds of brown coral rock, exactly like that described before, dipping on each side from the island at an angle of 8°,

but striking as near as possible north and south. The surface of the reef was composed of soft, spongy, fine-grained rock, many slabs of which were lying about, under which we found a few shells and crabs concealed, and in the holes of water were some living corals and many beautifully coloured fish. The spongy rock, when broken open, often exhibited a cellular structure in some parts, while others were entirely granular. There was not unfrequently an insensible gradation from one part to the other, as if fragments of coral had gradually wasted away externally and coalesced, the internal parts of each retaining more or less of their organic structure. Many old fragments of coral, also lying loose about the reef, although merely worn and weathered outside, were quite crystalline internally, the organic cellular structure being sometimes greatly obscured by a subsequent mineral structure, the formation namely of crystals of carbonate of lime.

On getting under weigh, we ran out to the edge of the bank, which was about six miles to the eastward, and within the space of a mile we passed from 30 to 85 fathoms. Everything brought up by the lead, from coarse fragments of coral to the finest sand, was wholly calcareous, all dissolving in muriatic acid. In the afternoon the wind freshened, with a heavy sea, and we ran back and anchored under the lee of Wreck Island and its reef.

Jan. 19, 20.—Blowing a fresh gale of wind, with

a very heavy sea, compelling us to remain at our anchors.

Jan. 21.—Captain Blackwood and Mr. Evans being ashore to "take sights" for the chronometers, found on the island some traces of the wrecked crew. On one tree was cut "The America, June, 1831;" on another "Mary Ann Broughton;" on another "Capt. E. David;" and "Nelson, November, 1831." There were likewise the soles of a pair of child's shoes, some bottles, some broken dishes, and an old cask. I believe the wreck was that of a whaler, and that the crew were taken off by another whaler, as there were no signs either of graves or bones.

Jan. 22, 26.—Leaving the Capricorn Group, we passed into a clear space, in which neither islands nor reefs were visible; and during these five days we traversed a space of between 40 and 50 miles wide, backwards and forwards, without finding any shoals except a five fathom patch of coral within sight of the Capricorn Group. On this patch we lost a small anchor, and spent a day in trying to recover it.

Jan. 27.—Standing to N.W. in search of Swain's Reefs, having already passed over part of the space in which they were laid down in the charts, when about 10 A. M., breakers ahead were reported from the mast head, and we shortly rounded the southern end of some reefs, and anchored in 30 fathoms on their western side, with the Bramble about a quarter

of a mile from us. The weather was squally and dirty-looking; the reefs, made in small detached patches, seeming to become stronger and more persistent towards the north. The sea made a clean sweep over them, breaking very heavily, and although pretty well to windward of us, they did but little in smoothing the water or lessening the swell. The wind still freshened, blowing from the S.E. and S.S.E., with dirty weather.

Jan. 28, 29.—Blowing a gale of wind, obliged us to remain at anchor, with a very heavy sea breaking over the forecastle. We veered to 140 fathoms on one anchor, and let go another with 80.

Jan. 30, 31.—The gale still continued, and drew gradually round towards the S.W., so that the reefs, which at first afforded us some little protection, were now our greatest danger, as they lay to leeward instead of to windward. Much rain fell, and the whole aspect of things was far from cheering, as in case of our cables or anchors giving way, we could have very little hope of being able to escape drifting on the reefs, where we should have been dashed to pieces in a few minutes.

Feb. 1.—The gale still increased in fury during the last night, and this morning broke dark and hazy, with the wind at W.S.W. We had yesterday been watching the Bramble as she rode over the seas, shewing half her keel at a time out of water; but at daylight this morning she was no longer to be seen, till, to our great relief, we discovered her a

mile and a half farther astern and nearer the reefs. It appeared her cable had parted during the night, but luckily another anchor brought her up before she reached the breakers, and by this she held on. This morning the topmasts were struck, and everything got on deck out of the rigging that was not down before. This, however, was the last of it, for in the evening it moderated, and both wind and sea gradually went down.

Feb. 2.—A lovely morning, with a light breeze from the east, and smooth water. Quickly getting up our masts, we weighed anchor, and stood to the south, quitting our anxious and dangerous anchorage, greatly to the satisfaction of all hands.

Feb. 3.—We parted company with the Bramble, as she was to trace the inside or lee boundary of these reefs, while we ran along their weather or eastern boundary, our rendezvous being Port Bowen, on the main land.

Feb. 4, 5, 6.—Running along and delineating the eastern edge of this large body of reefs, sometimes standing out into the offing to sound, and taking care on the approach of night to run into some of the openings, and anchor in a sheltered position among them. These reefs consist of a compact body of coral masses, intersected by narrow channels of deep water; each mass varies in extent from one to several miles, some of them being almost dry at low water, others having lagoons or hollows of greater or less depth. A very common

feature among them is a line of great detached blocks lying a little back from the outer edge of the reef, frequently not altogether covered even at high tide, and always quite exposed at low water. I landed on one reef from our anchorage of the evening of the 5th. We carried blue water from the ship for about half a mile, and then began to see the bottom in about seven fathoms, from which it shoaled gradually, but rapidly, till the boat touched the top of the coral branches. Scraping on, however, over these, and winding between the more solid masses of mæandrina and astræa, we reached some of the large dry blocks on the seaward edge of the reef. I found some of them to be huge masses of mæandrina, six or eight feet in diameter, much water-worn, and lying upside down, having been torn by some heavy sea from their place of growth on the weather edge of the reef, and washed two or three hundred yards back from it. Others were a species of massive porites, while others again consisted of various corals, all matted and compacted together. After wading about for a short time knee-deep, and collecting a few shells, holothuriæ, crustacea, and echinodermata, the flood-tide began to make, running in in a very rapid stream over the edge of the reef, and obliging us to hasten back to the boat. I got one or two very beautiful comatulæ, one especially of a rich dark purple or wine colour, almost black, but did not succeed in my first attempt to preserve it. I kept it in salt water during the night,

but in the morning it fell to pieces on being handled, although the separated arms still preserved motion and vitality after being thus broken, for at least half an hour. A block of coral rock, that was brought up by a fish-hook from the bottom at one of our anchorages, was interesting from the vast variety and abundance of animal life there was about it. It was a mere worn dead fragment, but its surface was covered with brown, crimson, and yellow nulliporæ, many small actiniæ, and soft branching corallines, sheets of flustra and eschara, and delicate reteporæ, looking like beautiful lacework carved in ivory. There were several small sponges and alcyonia, sea-weeds of two or three species, two species of comatula and one of ophiura of the most delicate colours and markings, and many small, flat, round corals, something like nummulites in external appearance. On breaking into the block, boring shells of several species were found buried in it; tubes formed by annelida pierced it in all directions, many still containing their inhabitants, while two or three worms, or nereis, lay twisted in and out among its hollows and recesses, in which, likewise, were three small species of crabs. This block was not above a foot in diameter, and was a perfect museum in itself, while its outside glared with beauty from the many brightly and variously coloured animals and plants. It was by no means a solitary instance; every block that could be procured from the bottom, in from 10 to 20 fathoms,

was like it. What an inconceivable amount of animal life must be here scattered over the bottom of the sea, to say nothing of that moving through its waters, and this through spaces of hundreds of miles. Every corner and crevice, every point occupied by living beings, which, as they become more minute, increase in tenfold abundance.

Feb. 7.—In attempting to weigh the anchor this morning, we found the cable had caught under some ledge of coral rock, and after carrying away the messenger as well as several tackles, we were obliged to wait till the ship swung to the turn of tide, when we weighed and let go in a better place. I took the opportunity of landing on the reef with Captain Blackwood, but we did not observe anything new.

Feb. 8.—We sailed with a fresh breeze, tracing the continuation of the reefs to the northward, and were obliged to make a tack or two in order to weather a point projecting farther to the eastward than usual; after which we stood out to the north-east for a few miles, when no reefs being in sight, we sounded and found no ground with 200 fathoms. We then stood back and anchored among the reefs, to leeward of those last seen, in 17 fathoms, with a very strong tide running in from the east.

Feb. 9.—In trying to weigh this morning, we again found the anchor or cable foul among the rocks of the bottom, and applying all our force, split the inner starboard hawse-pipe. Passing the

cable into the outer one on that side, we shortly split that also, and the cable began to cut down through the wood-work of the ship's bows, obliging us to veer instantly, and wait for a turn of tide. In the middle of the night, when the strength of the tide slackened, we again tried to get under weigh, but after carrying away the messenger, and damaging one of the port hawse-pipes, we were compelled to desist. The current for thirty-six hours continued to run very strong from the northward and westward, never varying more than three or four points in direction, and having strength enough to sweep the leads from the bottom and carry out the line astern, almost as if wood were fastened to it instead of lead.

Feb. 10.—This morning the ship swung a little to a slight change of current, and we found no difficulty whatever in weighing the anchor. It is probable, therefore, that after the anchor was let go, the ship, in swinging to the tide, dragged the loose cable under some strong projecting ledge, or overhanging mass of coral close to the bottom, so that all our efforts at tripping the anchor would only cause it to bite the deeper.

We now steered west into the body of the reefs, intending to pass through them and join the Bramble in Port Bowen, in order to refit our damaged bows and tackles a little. We passed through narrow channels, varying in depth from 10 to 30

fathoms, more commonly the latter, with reefs in every direction, as far as we could see, distinguishable even on the horizon by the light green of the shoal water upon them. The bottom, as brought up by the lead, was a coarse coral sand, composed of rather worn but angular grains and fragments of corals and shells, often the eighth of an inch in diameter; there were also many small chambered shells or foraminifera, and many flat circular disks were brought up sometimes as much as half an inch in diameter, which are, I think, the marginopora of De Blainville.* At 2 P.M., the sun having got to the westward, cast a glare upon the water that hindered us from seeing the channels between the reefs ahead, and compelled us to anchor.

Feb. 11, 12, 13.—Still sailing all morning to the westward through the reefs, and anchoring in the afternoon, the water perfectly smooth and the weather delightful. About 11 A.M. of the 13th, however, the reefs became fewer, and we began to feel a slight swell, and the depth increased to 45 fathoms. At noon the character of the bottom had changed from a coarse coral sand to a green sand with black specks, which latter remained untouched by muriatic acid, although the sand effervesced. At 1 P.M. we saw an island which proved to be "High Peak," and we found we were quite clear of

* Professor Forbes, however, has, since my return, informed me that he believes these are disks of acetabularia.

the coral reefs. We had now run 80 miles N. and S. along the eastern edge of this bed of reefs, and 90 miles right through them in a W.S.W. direction. How far they were continuous to the north, we cannot say; but omitting any minor breaks or irregularities, they stretch along the coast of Australia, across Torres Strait, nearly to the coast of New Guinea, a distance of 1000 miles.

CHAPTER II.

PORT BOWEN—BOAT CRUISE TO ITS HEAD—WALK TO SHOAL-WATER BAY—INTERVIEW WITH NATIVES—FRIENDLY COMMUNICATION—CRUISE IN THE PINNACE TO WEST HILL.

Feb. 14, 1843.—At day-light we were off Port Bowen, and at 8 o'clock anchored under Entrance Island. The surrounding country was picturesque in outline; many ranges of hills, both peaked and round-backed, rose near the coast, and could be perceived far back in the interior. Some of these, in both instances, must rise to a height of 2000 or 3000 feet above the sea. They had, however, a brown, dry, and barren appearance, especially near the coast, where a few lines and tufts of pine trees alone relieved the aridity of their aspect. We found the Bramble at anchor under Entrance Island, and at the turn of tide we both weighed, and tried to enter the northern side of the harbour. The Bramble led in, but shortly making the signal for three fathoms, we came to an anchor a little within some small rocky islets off the first sandy beach. We remained at Port Bowen for the rest of the month, during which a detailed survey of the harbour was

made. This was found, in consequence of shoal bars, not to admit of the easy entrance of large vessels farther than our anchorage. There were also some large pine trees cut on Entrance Island for repairing the bows and other purposes, for which the wood was found very well adapted; and by cutting up a small anchor, iron bars were substituted at the lower part of the hawse-holes for our broken hawse-pipes. In our excursions about the neighbourhood we found the whole country dried up, and not a drop of fresh water to be found any where, except a gallon or two, very thick and dirty, in a hole in Flinders' watering gulley behind Entrance Island. Although the peninsula of Cape Clinton abounded in gullies and water-courses, with evident signs of great torrents occasionally, we could not obtain a drop of water even by digging in them. All the grass was dry and brown. In consequence of this parched state of the country we found neither natives nor animals near us. The only trace of the former was a small hut near the entrance of the north-west arm, and a man's footstep on the sand leading to it. We saw also one day a native dog in that direction. All the rocks around were porphyry, generally red outside and greyish internally; but on the beach, near the ship, there were exposed at low water, some beds of a hard, compact, yellow sand-stone, containing pebbles of porphyry and fragments of recent corals and shells.

On the 20th, at 8 o'clock in the morning, Cap-

tain Blackwood with Dr. Muirhead and myself set off in the third gig, with four hands, to explore the southern arm of the Port. After sailing six or seven miles we found this arm, which had hitherto been two or three miles in width, split into two among the great beds of mangroves which bordered it on either hand. We took the right hand branch, which at half-past eleven we found turning to the west, and half-an-hour afterwards curving round to the north. It was still, however, three or four hundred yards wide, and twelve feet deep at high water. As we approached we had observed columns of smoke rising in two or three places on the slopes of the hills behind the mangroves, and at half-past twelve, we saw a small opening or path-way through the mangroves on our left hand, and immediately landed on it. It led directly to a small mount twenty feet high, and about twenty yards across, consisting of porphyry, but almost covered with scattered oyster shells, and thence through another narrow belt of mangroves to a projecting ridge of the main land. Crossing on to this we found a bare sandy space running at the back of the mangroves, between them and "the bush" or grasssy woodland, and a well-beaten native footpath leading along it both to the north and south. Ascending the ridge, which was probably about 300 feet high, and covered with gum-trees, we saw that the inlet we had come by ended altogether about a mile further to the

north, in an immense mangrove swamp that occupied all the space between us and the other part of the port. Looking into the interior of the country, or towards the westward, we caught glimpses through the trees of a large sheet of water about five miles off, and though this was probably only the head of Shoalwater Bay, it was determined to go and ascertain the point the following morning. Returning to the boat, accordingly, Captain Blackwood ordered the provisions to be got out on to the little mount, and the dinner cooked. Dr. Muirhead and I, meanwhile, took our guns and walked along the native path to the south. In about thirty yards we came on the recent footsteps of two natives, apparently a man and a boy. They ended suddenly near the rocks towards our encampment, but we tracked them back a long way, as if they had been following and reconnoitering our boat as she came up from behind the mangroves, but had leapt aside into the bush on our landing. In about half-a-mile further we came on the track of four men running, but this was two or three days old. Near this was a pretty little grassy plain, about half-a-mile wide, in which was a deep winding watercourse, now quite dry. The grass was of fine quality, and breast high, but it did not extend to the hills, which everywhere surrounded the little plain. Except one or two small birds, we could not find a living thing, so we returned to our camp and dinner. In the evening we were assailed by such

clouds of musquitoes and sand-flies that we determined, leaving the men to guard the boat, to shift our quarters to a higher spot in hopes of escaping them. We accordingly selected a spot some distance up the ridge, but within hail of the boat, and taking our two dogs we lay down on our blankets. Here, however, we could get no sleep until we had lighted a large fire under the lee, and in the smoke of which we, in some measure, eluded our insect pests. At four in the morning, we went down and got some tea and bread; and just as the day broke we heard a long drawn "coey" or native cry at a distance. It had a fine harmonic tone, as if proceeding from several voices.

Feb. 21.—Leaving two men with directions to get everything into the boat, and shove off into the middle of the stream, we set off at daylight along the native path to the northward, but shortly left it and struck up some low rocky hills on our left hand. We found much of the wood had been recently burnt, leaving the rocks all bare. These were entirely porphyry. We kept along the summit of a ridge leading to the westward, and shortly, at the head of a deep little valley on our right hand, started two large kangaroos. Our only kangaroo dog, however, was too much out of condition to catch either, though very near it at one time. Descending from the rocky ridge, we crossed a sandy flat very thinly covered with grass, the wood, both here and on the hills was small, principally gum-trees,

with many small stunted grass-trees. Several water-courses traversed the plain, but they were all dry. In about five miles from our camp we came on a small channel full of salt water, and presently after on the edge of a large mangrove swamp. Crossing, with some difficulty, a channel where we sank more than knee deep in mud, we got on a bank beyond it about a hundred feet in height, but could not see far from the closeness of the trees. Satisfied, however, from the salt water and the large mangrove tracts, that it was the head of Shoalwater Bay we had struck out upon, we returned. Some fine showers of rain now fell, in some degree cooling and refreshing the hot close woods. Taking a slightly different route from that we had come in by, we struck out on the native path about a mile to the northward of our camp. On coming within sight of this we saw a lot of dark, naked figures come trooping over the mount through the trees, and occupy the opening in the mangroves which led to it, as if to dispute our passage. We immediately halted, not without a passing apprehension that they had murdered our two men, and destroyed the boat. Captain Blackwood, giving me his gun, went forward unarmed with a green bough in his hand, sat down on the ground, and practised all the ceremonies which we had been informed were expressive of friendship. None of these blacks would come forward, however, but kept under the shelter of the bushes with much shouting and jabbering from one

to the other, as they stood scattered behind the mangroves, and up the hill in their rear. They were all armed with spears, but on Captain Blackwood calling us to come up, and our advancing to the opening, they retired a little leaving the path open Three or four stout fellows kept near us, to whom we took off our hats, held out our hands, shouted and danced.

To one I gave a small knife, and showed him how to use it. They seemed good tempered, and rather afraid, as most of them kept thirty or forty yards back up the slope of the hill. They were stout, strong, broad-shouldered fellows, in the prime of life, and we now counted seventeen of them. On coming to the boat, we found her all safe, as well as our two men. They said that two black fellows came down soon after we left, and after scouting about for some time, disappeared ; but about an hour before we returned, they suddenly found themselves surrounded by twenty men with brandished spears; that they made signs of peace to them, and so far succeeded as to get everything into the boat except the stove of the boat's coppers, which was still hot and rather heavy. It being now low water, however, the natives easily waded off to the boat, and surrounded them, Still they did not offer violence, and though very curious in the examination of the boat's sails and gear, and desirous of the former, they desisted from taking it on signs being made to them to do so. They were evidently unacquainted with

fire-arms, as one of them laid hold of one of the men's muskets and tried to pull it out of his hand, holding it with the muzzle against his breast, but on being threatened, gave up the attempt. Our men prudently did not fire upon them, or attempt to use force, and the only thing now missing was the stove.

While we were seated on the mount, getting some refreshment and hearing this account, the natives were all assembled just outside the mangroves at the foot of the ridge, chattering and laughing most vociferously, and one fellow sat in the fork of a tree watching our motions, and apparently describing them to his comrades. Presently we heard something rattle like the stove struck against a stone, and picking up our guns, we rushed out. The natives slowly retired up the ridge, at the foot of which, under a tree, we found our stove. Pointing to this, we shook our guns at them, and scolded them for taking it away; and, pretending to be very angry, we waved to them to leave us and go away. They seemed to understand this, and several of them, picking up nets and baskets, pointed to them and then to the water, as if to assure us they were going away fishing. The nets seemed well made, consisting of a bag with its mouth stretched over a kind of bow, or stick bent into a semi-circle by a stout string. They then all went away towards the north, and the place became perfectly still, so that we cookéd and eat our breakfast in tranquillity about noon, but were obliged to wait till two P. M. for the

tide coming up to float our boat. We found at low water this muddy inlet dry nearly all across.

Just as we had got everything into the boat, I happened to say I wondered whether the black fellows were still within hearing, and going to the edge of the mount, gave a loud "coey," when, to our great surprise, it was instantly answered close to the mangroves on all sides of us, and the chattering and hubbub of voices commenced as loud as ever, although for two hours not a sound had been heard. Taking a preserved meat canister, an empty bottle or two, and some knives and handkerchiefs, we determined to go and have a talk with them. Advancing slowly, accordingly, and holding out our presents, four or five of them were induced gradually to approach us and receive them, and we walked together up the ridge towards the rest. There were now sixteen of them.

Arrived at the spot where we slept last night, we leant our guns against a tree and sat down, those nearest us doing so likewise. Now commenced a great palaver, in the course of which we went through the motions of drinking water, imitated the leaping of a kangaroo, and dancing a corrobory, all which they seemed to understand; but we could not learn from them where the fresh water was to be found. We shewed them the ashes of our fire, and laid our heads on our hands to shew we had slept there last night, at which they nodded their heads, as if to say they were fully aware of that.

Presently an old grey-headed man came down the hill, whom they all pointed out to us, and calling him, Captain Blackwood placed on his head a red worsted nightcap. The old gentleman leant forward to have the cap adjusted, with great earnestness, and then, with a grave and dignified countenance, took his seat among us, as if admitted of our company. Paying no further attention to his own tribe, he spoke first to one and then to the other of us in a low, serious tone of voice, and pointed to the dogs (of which they were rather afraid), as if requesting them to be removed. Ten more young men, with white sticks through their noses and spears in their hands, now joined us from the mangroves round our mount, where they had been lying in ambush. They all then rose, and began rather to press upon us; by Captain Blackwood's desire, accordingly, I called their attention, and fixing an oyster-shell in a tree about fifteen yards off, fired a ball into it. They started at the report, and one or two in the rear threw themselves down, but either they did not comprehend it, or trusted wholly in our good intentions, as they did not seem to care much about it. One man, indeed, laid hold of my gun, as if to take it away, but desisted on my looking grave and shaking my head. I asked for a spear from another to whom I had given a knife; he was rather unwilling to part with it, but on my pointing to the knife in his hand, and gently detaining the spear, he let it go, laughing at me, however, and shaking

his head, as if to say, "I am afraid you are cheating me." The spear was merely a long light stick, pointed at one end and not very straight. We now took our leave of them, raising our hats, and bowing, and waving our hands, in which latter action they imitated us. There were then twenty-four men and two boys visible, but no women. They were all perfectly naked, and the men were stout, broad-shouldered, stalwart fellows, and fat withal. Some of their countenances were good-humoured and intelligent, others more reserved. They did not follow us down the hill, but saluted us with a farewell "coey" as we embarked and shoved off.

Want of water was now becoming a serious matter, as there was only two or three weeks' supply left on board either vessel. The pinnace had been sent under Lieutenant Ince* to the Percy Islands to look for it, but returned unsuccessful. The Bramble accordingly was dispatched to the northward to search for water, and the pinnace was again sent under the command of Mr. Aird† to look along the coast immediately north of Port Bowen, as for the next sixty miles the inshore navigation was too intricate and dangerous for a large vessel. West Hill, immediately N. of Broad Sound, was named as our rendezvous. I accompanied Mr. Aird in the pinnace, in order to see as much of the land as possible. We had, however, a very rough and boisterous cruise, and were obliged, by the badness of the weather, to content ourselves with merely running

* Now Commander Ince. † Now Lieutenant Aird.

from one place of shelter to another, among the little islets which here fringe the coast.

On *March* 3, we came in sight of West Hill, and after passing through some heavy seas and tide races, which filled our open boat once or twice up to the thwarts, we crossed Broad Sound, and sailed down along shore to the northward. The coast of the main land hereabouts is formed of a low sandy shore, with a flat country of five or six miles wide behind it, backed by a bold range of lofty hills, or rather a high flat-topped ridge, perhaps the edge of a table land. Here and there a conical hill stands out in advance of the range, and West Hill is one of these, rising directly from the sea to a height of nearly 1,000 feet. We saw smoke rising in two places from the top of the high land at the back of the coast, and in one from the slope of West Hill. The wind was now moderating and the sky clearing, and, for the first time during our boat cruise, the weather became pleasant. About one P. M, we rounded West Hill, and entered a wide shallow bay, with a broad sandy beach, to the northward of it, where we shortly anchored in four fathoms, about a quarter of a mile from the shore. Having dined, Aird and I landed, taking our guns and two men armed with muskets. As soon as we had got ashore, we heard the shouts and coeys of the natives on a woody cliff on our right hand. Two or three shewed themselves at the edge of the wood below the cliff,

but retired as we advanced upon them, and took their post on the top of it, in an excellent position for throwing spears. They were painted with white streaks on various parts of the body. Giving my gun to Aird, I advanced with extended hands to shew them I was unarmed; then, gathering a green branch, sat down. They shouted and used much gesture and vociferation, and appeared very unwilling to approach, waving to us with their hands, as if to go out of the bay. I at last rose, and gradually got near an old lame man, who had remained below the cliff, and induced him to come to me, which he did, holding his spear and waddy ready for action.

While I kept him amused as well as I could, Aird came up, and one or two of the tribe likewise advanced to us. We then tied an old pocket-handkerchief round the old man's head, after which he spoke much and earnestly to us, frequently pointing to his knee, which was bent and much swollen, and talking in a lamentable tone of voice, as if describing his misfortune. We sympathised with him as much as possible, and then asked him by signs for fresh water, when he pointed in both directions along shore. We now left them, without taking any notice of the rest, which with these savages is often the best way of encouraging future friendly communication. The tide receded a long way, leaving large flat sands exposed, on which were a few oyster-catchers and curlew. We shortly, however, came

to a channel which separated West Hill from the main land, about a quarter of a mile in breadth, very muddy and bordered by mangroves.

In returning we came on a place where the natives seemed to have been playing at some sort of game. Several flat tabular pieces of stone, about the size of an octavo volume, were stuck upright in the sand in a certain order, while others, both flat and round, were lying dispersed about. Striking into the bush a little, we came on a water-course, in which were several holes full of excellent water, the last of which was just by the beach. A quarter of a mile beyond we saw several women and children wading about in a muddy flat, apparently collecting shell-fish; a man was standing on the beach as a sentry, who, as soon as he saw us, called to the women, and they all quitted their occupation and hastened into the bush, the man taking the rear and guarding their retreat. When we came back to the boat, at low water, we found a heavy surf breaking around her, and that she was barely in one fathom water, shewing the tide to have fallen 20 feet since we anchored; we accordingly weighed and anchored again further out. Soon after sunset, Aird called my attention to a long bright ray of yellow light, rising perpendicularly over the tops of the trees in the west, just over the place of the sun. We could not conceive what it could be, but afterwards found it was the first appearance of the fine comet of this year.

March 4.—Early this morning a native came down to the beach, opposite the boat, and shouted and gesticulated for a long time, but there was then too much surf to land conveniently. When the flood tide made, we went ashore to fill our breakers at the water holes, and met three natives who, after coeying a little, came up in a friendly manner, apparently satisfied of our good intentions. I exchanged a bottle with one for a waddy, or short club. Aird and I left them with the watering party, who were armed, and set off to walk in the bush; but on our ascending the hill, they shouted and came towards us making signs not to proceed, one of them pointing to his legs and twisting his hands round, as if to shew they would be entangled. Accordingly, a very little distance up the hill we came on the edge of a jungle, consisting of branching trees matted together by innumerable creepers hanging from the branches and trailing on the ground. This kind of wood occupied all the upper part of the hill, from which it extended down the gullies nearly to the shore, the intermediate parts and the flats only being covered with the usual open woodland of grass and green trees. In the latter there was excellent green grass covering a rather rocky ground.* This jungle was quite impenetrable. We now walked to the outer point where were some small hills, covered with long grass, under which, how-

* I believe this kind of matted forest is called a "brush," in the northern part of New South Wales.

ever, the ground was completely covered with angular blocks of rock. From this point we saw the Fly in the offing among the islands, and hurrying down, got off our breakers and went to meet her. She anchored some miles out, and we got on board about 5 o'clock. This evening we saw the comet very plainly.

March 5.—A party went ashore for water this morning, and found another chain of water holes a little farther in the bay. The ship was accordingly moved farther in, a tent sent ashore, and preparations made for completing our water. By means of a force pump and hoses the casks could be filled on the beach, not far from where the boats anchored; but as the ship could not approach within much less than three miles of that spot, it was of course rather a protracted business. We remained at this anchorage till the 13th, during which time I accompanied Captain Blackwood on two excursions to the southward. On each excursion we traversed the plain between the hills and the sea, and found it some six miles broad, covered with beautiful grass and fine timber, well watered with several little brooks issuing from the recesses of the hills. It was indented by muddy inlets, bordered by mangroves, which, at high water, allowed of the passage of boats of considerable size. The soil was generally hard, stiff, and dark coloured, but became rocky near the hills. The lower parts of the hills were made of a hard and compact brown sandstone. The

natives avoided us as much as possible, and shortly disappeared altogether from the neighbourhood.

The seaward cliff of West Hill, and apparently the mass of the hill itself, is composed of a very fine grained trap or basalt, with small crystals of feldspar, only visible with a lens. The rock is split, by innumerable joints and veins crossing at all angles, into masses of all shapes and sizes. In a few places were traces of nodular concretions, and in others the rock split into flags. On the north side of the point, within the bay, another kind of rock shewed itself, forming low disconnected cliffs at the edge of the flat land beneath the hill. This was a rather soft, dull, earthy sandstone, generally fine-grained, but sometimes containing small quartz pebbles. Its colours were brick-red and white, the red appearing generally in irregular blotches, or sometimes looking like nodular concretions. These blotches were sometimes arranged in lines, and if they marked the stratification, it in one place dipped west at 15°. There was no lamination visible, nor any clear lines of bedding in this rock; but in one place it was capped by a dark brown sandstone, which was very distinctly bedded, and resembled some parts of the magnesian limestone near Nottingham, in external appearance, having similar small thick lumps and plates. This was in a horizontal position: neither of them contained any organic remains, so far as I could discover.

March 13.—Weighed and ran to the northward,

anchoring in shoal water a little north of Cape Palmerston; the surveying officers employed in laying down the coast and the neighbouring islands.

March 14.—At daylight, Captain Blackwood, with Mr. Melville and myself, left the ship in the first gig to examine an opening in the shore like a harbour. We passed a small headland of red quartzose rock, on which we landed for a short time, and then steered for an opening in the mangroves ahead, which, however, we soon found to be a mere shallow creek. We then rounded another rocky headland, and landing on the inside of it, proceeded to the summit. From this we looked over what appeared a very fine port, five or six miles deep and three miles wide, but surrounded by a thick belt of mangroves round its upper portion. It was now high water, and we proceeded in good spirits to examine it, crossing in a N.W. direction. To our great regret, however, we got nowhere more than five fathoms in sailing across, and this only in a few places, the usual depth being only three or four. We steered for two grassy hills near the N.W. corner of the bay, and went first to examine an opening at the back of them, which we soon found, however, to be a mere shoal, muddy channel, winding among a great expanse of mangroves. Returning, we rowed nearly round the hills into a sandy cove, in approaching which the boat got aground, and as the tide was rapidly falling, she was shortly high and dry.

Meanwhile, we waded ashore, and got our things out of her on to the beach, where we camped for the night. We shot a few small plovers on the beach to add to our dinner, and while it was being cooked, walked up the hills near us. These were grassy slopes, the open woodland having very fine long grass everywhere about it; but much of the lower and flatter spaces, and some of the hills, were occupied by dense jungle. In this jungle were tall trees, with dark, umbrageous foliage, very different from the light, thinly-leaved gum-trees, and having immense creepers and climbers, like great ropes, stretching from tree to tree, and hanging down and matting the underwood into an impenetrable thicket. When we reached the top of the hill, it was low water, and we saw our fine looking port had now hardly a drop of water over half its space, the tide having receded to its entrance, and left mere detached pools among the mud flats and sand banks of the inner portion. The belt of mangroves appeared to stretch a mile or two into the interior of the country, but there seemed to be a considerable space of fine grass land between them and the hills, which were here more broken and detached than they were to the south of West Hill. Having returned to our camp, and dined about sunset, we made preparations for sleeping quite securely on the beach, as a fine sea breeze was blowing on it, but before ten o'clock this unfortunately died away, and for the remainder of the night we lay sleepless and helpless, but not

unrepining, victims to a numerous host of sand-flies and musquitoes. Compared to these pests, savage men or ferocious beasts are really slight evils, since they may be guarded against or overcome, while these plagues render life miserable, and paralyze all one's energies by continual irritation and long want of sleep, without either the dignity or excitement of danger.

March 15.—We found on the beach this morning the remains of a large dugong, which had been feasted on by the natives, consisting of the skull and part of the vertebræ and flippers; it was too much burnt, however, and broken to make it worth bringing away, although the flesh still adhered to it in some places.* About six o'clock we continued our route along the north shore of the bay, shooting fifteen or sixteen plover out of a large flock as we proceeded. At the mouth of the bay we landed to ascend a green hill, forming its northern point, and saw thence another considerable indentation of the coast about two miles to the northward; and it being determined we should go and examine it, Melville and I decided to walk across while Captain Blackwood went round in the boat. We found the

* The upper part of the skull was thirteen inches long, six inches deep, and eight and a half wide. I subsequently succeeded in getting a fine skull and other parts of the skeleton from Port Essington, where it was procured and prepared by Dr. Sibbald. I sent it to Professor Owen, whose description of it will be found in the appendix.

intermediate country a rich grassy woodland, the trees large and wide apart, and the grass so long and thick as considerably to impede our progress. In a hollow, just at the back of a mass of jungle, lying at the head of a small sandy cove, with a reef of rocks at each point of it, we found several deep holes and small pools of excellent fresh water; and immediately after, came on a round bare grassy hill, just over the south point of the little bay. From this hill the bay appeared about two miles wide, stretching four or five miles into the country, with several coves and rocky headlands on each side, but large beds of mangroves round its upper portion. The country around, with the exception of the mangrove swamps, was very beautiful; low green hills, rising in every direction, with grassy slopes and fine timber. At the back of this fresh and fertile looking country, and distant about ten miles, continued the bold ridge of hills running parallel with the coast, and probably 2 or 3,000 feet in height. While we were looking at the view, the gig came round, and landed in a cove below us, and we hastened down to it. At the foot of the hill we crossed a small marsh, now dry, in which grew a very tall reed-like grass, large spaces of which had recently been pulled up by the roots, bare clods and the loose grass lying about in heaps. The root of this grass is probably eaten by the natives, and it was the only sign we saw of their presence, except some large smokes rising a few miles farther to the

northward. We saw no animals, except a reddish-coloured rat among some stones on the beach, of which, however, I only succeeded in catching the young ones. We now crossed to the north shore of the bay, but though it was high water, we nowhere succeeded in finding a greater depth than four fathoms. We established ourselves for the night on a little sandy beach at the foot of a green hill, where was a small deep hollow that the boat would probably float in at low water, and enable us to ascertain the rise and fall of tide. This was found during the night to be 25 feet 6 inches, the moon not yet at the full. The spring tide rise and fall, therefore, is probably little less than thirty feet. Just before sunset, in a gap in the nearest range of hills, we could count three other ranges immediately behind it, the last very distant. Still I could not be sure that they were distinct ridges, as they might be only the projecting points of an indented table land; I am however inclined rather to look upon the hills as composed of parallel ranges than as a level table land.

March 16.—Though at breakfast this morning we consumed all our remaining stock of provisions, Captain Blackwood decided on running up the bay with the flood tide, to examine one or two considerable openings in the mangroves. We first tried one going in at the N.W. corner, but as it did not look promising, returned and went up one running due west. A very strong flood tide swept us rapidly up

the inlet, which gradually narrowed and wound about for the first three or four miles, when we found ourselves near some rocky, woody hills, with steep banks, and the inlet having all the aspect of a river. We landed at one or two points, but could get no view for the trees; and proceeding, came on more mangrove flats, till at length our winding channel ended when about five yards wide and five feet deep, having a mangrove swamp on the right, a thick jungle ahead, and a steep bank of gravel, about twenty feet high, on our left hand. Climbing up this, we found a level grassy woodland, stretching away to S. and W. as far as we could see for the trees, and walking about half a mile, found one large and deep water-course and several smaller, leading towards the inlet. They were now all dry, but a little drain of fresh water came out of the jungle ahead of the boat. The small cliffs were composed of gravel; the lower part a confused heap of quartz pebbles the size of the fist, but the upper part of much finer materials, with layers of sand pretty well sorted and stratified, and of course horizontal. As we were under the necessity of going back immediately, in order to save the tide, we had not much time for examination, and at half-past ten set out on our return. The ebb tide took us as rapidly down as the flood brought us up; and after passing a heavy sea on a shoal bar at the mouth of the bay, we made sail for the ship, which had now run down a few miles to the northward. The rocks about

these two shoal bays were all rough slate, or grey-wacke, or quartz rock, with a dip to the west in the only spot where the stratification was discernible.

March 17, 18.—Running slowly on along shore to Cape Hillsborough, visiting Li. Cumberland Island on our way. This island exhibited a singular mass of rocks, looking as if made up of angular fragments of compact feldspar cemented together. Cape Hillsborough is a bold headland, 900 feet high, very steep nearly all round. Its base was composed of a singular assemblage of quartzose rocks, unstratified, and containing several imbedded minerals. The upper part is composed of stratified materials, in thick, well marked beds, dipping S.W. at an angle of 15°. On the inner side of the headland, accordingly, these rocks are found at the sea level. In the cliff on the north side of the hill, about 300 feet from the summit, the stratified rock is white, earthy, pulverulent, easily decomposing, but pretty tough when in mass; much worn into hollows with overhanging blocks and ledges. It contains either angular fragments or worn crystals, of a green translucent mineral, like a dull variety of feldspar, but which may be olivine. Large round blocks of a black rock were also seen embedded in it, but in an inaccessible position. The materials, notwithstanding their regular stratification and dip, look very much as if of volcanic origin. In the country at the back were some singular small conical hills, capped by clusters of small basaltic columns.

March 25.—Anchored in Port Molle, at the N.W. end of Whitsunday Passage. At four this afternoon I accompanied Captain Blackwood to explore the head of the harbour, where, to our surprise, we found a broad passage right through by Pine Head, leading round again into Whitsunday Passage. We never got less than eight fathoms water, but met with strong tide ripplings once or twice. We slept on a little rocky island at the opening of this strait, and the next day landed on the main, but found the woods too dense and the hills rising too abruptly to admit of much exploration. The shores here rise in a very steep slope, with occasional precipices to a height of several hundred feet, and are completely covered by a magnificent forest, the greater part of which are pine trees. This pine is closely allied to the Norfolk Island pine, but is a distinct species and much handsomer in appearance. It is found occasionally along the east coast of Australia, especially on rocky hills, from Port Bowen to Cape Melville, but Whitsunday Passage seems to be its head-quarters. The timber is rather encumbered by knots, but reported on very favourably by the carpenter of the Fly for many ship's purposes. Captain King made a spar of it, and speaks well of it.

On returning to the ship, we found a melancholy occurrence had taken place. Dowling, the coxswain of the pinnace, and an excellent man, had been some days ill with a low fever. He hung in a

hammock under the forecastle, with a man constantly attending on him. At four o'clock this morning, however, on the hands being turned up, his attendant went below to get a drink of water, and soon after his return, found the hammock empty: search was instantly made all over the ship, but in vain, and Dowling was never seen again alive or dead. It was supposed he took advantage of the absence of the attendant to throw himself out of the bow-port, and was thus drowned. It was the first death that had occurred among us, and was felt accordingly.

The rocks of Port Molle and its neighbourhood are of a doubtful character, it being often difficult to say whether they are of purely igneous or of metamorphic origin. In some places they are certainly stratified, being then a yellow or grey hard fine-grained gritstone, or greywacke. The dip in these was always W. or W.S.W. In other places, without altering much in mineral character, the rock contained many small dispersed crystals, and thus in hand specimens had the appearance of a porphyry.

The rock of Ragged Island, north of Port Molle, is sometimes a greenstone, or sometimes a finer grained igneous rock, but with many doubtful masses. In the little cove where we landed was a small coral reef, on which at low water several masses of madrepora and mæandrina were left dry almost to their bases, although still living. About high water mark were several beds of recent coral conglomerate,

containing shells and corals. It was hard, thick-bedded, and quite horizontal.

The tract of coast between Broad Sound and Whitsunday Passage, or the parallels of 22° 15′ and 20° 20′, differs in some respects from any other part of the coast of Australia we visited. Its apparent fertility is greater, it is better supplied with fresh water, and the rise and fall of tide is much greater. A solid range of hills, of a pretty uniform height, cuts off from the interior a lower undulating strip of land, from five to ten miles broad, the whole of which seems to be of a high average fertility for Australia; the grass was fine, close, and abundant, the timber large-sized and various in kind. The coast is indented by many small bays and inlets, and though these are dry at low water, many places might be found where small vessels could lie then securely in the mud, and be floated again at the return of tide. The great rise and fall of tide is of course admirably adapted for the construction of docks for building and repairing ships, and besides the pines, which in some places are very abundant, there is a probability of other good timber trees being found in the jungles, which are so different in character from the common gum forests of the country. A few miles off the coast are numerous small islands, lofty, rocky, and picturesque in character, and covered with grass and pines, with many small coves and anchorages. Outside these again are coral reefs, all uniting to shelter the coast and ex-

cellent anchorage is universally to be found along it. The trade wind blows constantly from the S.E., but owing to the strong tides, vessels would be able easily to work up against it, the water being always smooth, compared with the open sea, having no ground swell in consequence of the reefs to windward. This fresh perpetual sea breeze would render the country healthy, notwithstanding the mangrove swamps. These could all be avoided in choosing places of residence, for which spots 200 or 300 feet above the sea might easily be selected. The inlets through the mangroves would afford a boat navigation of a few miles into the interior of the country. As far as climate is concerned, almost any tropical production might be cultivated, but I have too little confidence in the nature of the soil of any part of Australia to recommend *that* as a source of profit. If, however, it should be desirable to push the settlements of New South Wales farther to the north, I think this part of the coast has greater natural advantages than any other we have seen. I cannot recommend any particular spot in preference to another, as the subject was not in my thoughts at the time we were upon it.*

* Penal stations or convict settlements would not, in my opinion, be advisable anywhere to the northward of Sandy Cape, since escape by sea to the northward would be so very easy. The coast being everywhere sheltered by reefs and islands, indented by small bays and mangrove creeks, the frailest canoe might be used along shore, and concealment from pursuit easily obtained,

The height of the tide just hereabouts is very remarkable. A similar occurrence is found on the North-west coast of Australia, about Cambridge Gulf and Buccaneer's Archipelago. In each case the great rise and fall extends only over a limited space. At Cape Palmerston, for instance, the rise is from 24 to 30 feet, while at Port Bowen to the south, and at Port Molle to the north, the rise and fall is only 16 feet. At Port Bowen the flood tide comes from the south, while at Broad Sound, and thence to the northward, the flood tide comes from the north. It is probable, then, that the meeting of the two streams of flood causes the tides to have such a height in the intermediate space. The great gap in the Barrier reefs, where Flinders passed out, a little north of Cape Upstart, is probably the cause of the northerly flood between that point and Broad Sound; the tide wave finding a readier access through that space into the inner belt of water than from the southward through the rocks and shoals of the Percy and

while life might always be supported by oysters and shell-fish, and the fresh water so frequently found near the coast between Sandy Cape and Cape York. Escaped convicts might ultimately take refuge among the islands of Torres Strait, where they would be well received by the natives, and where they might assemble perhaps in sufficient numbers to seize a vessel passing through, or by going up the Gulf of Carpentaria, would find a refuge among the Bugis, who come there in January for trepang. A post at Cape York would obviate much of the risk of escape, but not all, as, if the convicts were aware of it, they might pass it in the night.

Northumberland Islands. Mr. Evans, master of the Fly, informed me that the tide wave strikes the whole East coast of Australia, from Sydney to Torres Strait, much about the same time, namely, eight o'clock, at the full and change of the moon. He also told me that in the tract about the Palm Island, Rockingham Bay, and Endeavour River, there is no tide at all. I have never heard any explanation of the high tides on the North-west coast of Australia. As no other point on the west side of the South Pacific that I am acquainted with—certainly none near the colonies—has tides anything like so high as this tract of coast between Broad Sound and Whitsunday Passage, it seems destined at some future time to be the spot where the great ship-yards of that part of the world shall be situated; but whether the time is come when such an establishment would be advisable, I am not competent to judge.*

* After twice circumnavigating Australia, and visiting all its colonies, especially those of the southern coast, I look back upon this tract between 22° and 20°, with still higher expectations than before, and certainly have never seen any part of Australia, *near the sea*, of equal fertility, or of nearly equally pleasant and agreeable aspect, or combining so many natural advantages.

CHAPTER III.

CAPE UPSTART—GEOLOGICAL STRUCTURE—PUMICE PEBBLES—EXCURSION TO CAPE CLEVELAND—INTERVIEW WITH NATIVES—GRANITE DYKE—EXCURSION ACROSS UPSTART BAY—ASCEND MANGROVE INLET—INTERVIEW WITH NATIVES—FRIENDLY DEMEANOUR—EXCURSION UP WICKHAM RIVER—INTERVIEW WITH NATIVES—TWO TRIBES—UPROAR AT MEETING—FRIENDLY WALK—GENTLE MANNERS—RETURN DOWN RIVER—CHARACTER OF NEIGHBOURING COUNTRY—RETURN TO SHIP—LEAVE CAPE UPSTART.

March 30, 1843.—Anchored this evening on the lee or north-west side of Cape Upstart, alongside the Bramble. Cape Upstart consists of a great mass of granite, about 2,000 feet high, rising abruptly from the water on all sides, and connected to the mainland by a mangrove swamp only. It is singularly rugged and barren in its aspect; its sides covered by huge blocks of loose rock, scantily hidden by a scrubby vegetation. A narrow rocky valley, with a small watercourse, runs down from the centre to the north-west side of the promontory, having good fresh water constantly in its deeper holes, and frequently running in a considerable stream. Near this is a small plain, about half a mile across, with a sand beach and small mangrove swamp; and near the north-west point of the Cape is another little

plain, separated from the open sea by one or two detached hills of granite, 100 or 150 feet high. After heavy rains, a little water-course traversing this is likewise full of good water. These two little plains, although several feet above the reach of any possible tide, and covered with grass and trees, both old and young, are found just below the superficial covering of sand to rest upon coral rock, or the recent conglomerate mentioned before, consisting of coral sand compacted together into hard rock, with imbedded fragments of corals and shells. At the head of the bay, in the "seining cove," this rock is again seen forming a small flat, covered with trees, at the foot of the granite rocks. It is seen in one or two places along shore on the beach, where it frequently has nearly the same inclination as the beach itself, but where it is now much worn and broken by the sea washing against it. Over the whole of these flats, among the grass and under the roots of the trees, are found pebbles of pumice. Wherever we have landed, from Sandy Cape to this place, this singular fact has been observed. At Sandy Cape pieces were brought off to me larger than the fist; but at Cape Upstart and the neighbourhood they are generally about the size of a walnut, well rounded, and smooth externally, light enough to swim in water, of an olive green or grey colour in general. I have never observed them at a greater height above the sea than fifteen feet. They have never been seen floating in the water nor lying on the actual beach,

where they could have been recently brought, but always among grass and old trees, and sometimes embedded in the conglomerate, which, although of recent origin, the sea is now wearing away.

A small kangaroo is common among the rocks of Cape Upstart, being often seen peeping over their summits, but darting into the holes and crevices on the slightest movement. We shot some, but I unfortunately lost the only skin I preserved. It agreed nearly with Gould's *Macropus penicillatus*, except that it seemed a little larger, and the rusty colour about the rump was not very apparent. One measured—End of nose to root of tail, 21 in.; length of tail, 19½ in.; head, nose to base of skull, 5 in.; girth of body just before the thigh, 18 in.

Immense beds of mangroves stretch round the head of Upstart Bay, and a wide flat runs for some miles beyond them into the country, over which are seen some bold hills, in separate groups, rising like islands out of the flat country. From their contours these hills are undoubtedly composed of granite, like Cape Upstart and the other hills on the coast. At one part there was a considerable space between two of these groups, in which no high land was visible, the flat seeming to stretch like a broad river valley into the interior. On our subsequent visit, however, to this anchorage, in 1844, being on deck one clear morning, just at day-break, I saw this gap filled up by a very distinctly marked range of hills, very distant, and evidently raised above the horizon

by refraction. They formed a level flat-topped range, with steep sides. As the sun rose they melted away, and became invisible.

Cape Upstart was the point named for our rendezvous with a store-ship, that, on our first cruise, was to be dispatched from Sydney with a fresh stock of provisions and necessaries for us. As waiting for this would necessarily cause some delay, advantage was taken of it to get the magnetical observatory and the astronomical instruments ashore. The pinnace also was hauled up, it being determined to raise her sides, and fit her with a false keel and a shifting-deck, to enable her to keep the sea while we were engaged in surveying. During the whole month of April these occupations were carried on, and we had quite a little settlement ashore. Lieutenant (now Commander) Shadwell, superintended the magnetic observations, which were continued throughout the month. The natives luckily did not come near the point of the Cape, though they were numerous round the head of the bay.

On *May* 2, Captain Blackwood, Lieut. (now Commander) Ince, Mr. Harvey, and myself, set off in a cutter on a cruise to the northward. We had very rough and blowing weather, but reached as far as Cape Cleveland.

On our way we landed at the head of the bay, between Cape Bowling-green, and Cape Cleveland. Cape Bowling-green, and the land round it, is absolutely flat, and but little above the level of the sea. It is apparently comprised of large mangrove

swamps and mud flats. It looks very like the delta of a large river, and it is probable that considerable streams come both from the northward and the southward, out of the valleys of the mountain-range that runs along the back of this eastern coast, and pour their united waters over this flat. The Burdekin, and others mentioned by Dr. Leichardt, are, in all probability, these streams. We landed on the south-east side of Cape Cleveland, the geological constitution and the aspect of which is just like that of Cape Upstart. Cape Cleveland, however, is still more broken and abrupt, and also more woody than Cape Upstart, having fine pines in many of its gullies. We followed a native path for some distance along the beach, towards the point of the Cape, and in one cove behind the sandy beach we found a pool of fresh water. In this we enjoyed what in Australia is a rare luxury, a fresh-water bath, and while dressing, we saw suddenly a column of smoke rise up over the trees near the foot of the hill, and quickly disappear again. This we took for a signal, and had no doubt that every motion of ours was followed and watched by the natives, although we could not perceive them. This is one of the inconveniences of landing for a walk on this coast. However desert and uninhabited the place may appear, even for days together, you must always walk in the expectation that a native has his eye upon you, and may perhaps be lurking within spear throw. This necessity for constant vigilance is very irksome at first, as you never can give your

undivided attention to any object you may meet with, nor be utterly regardless of the movements of your companions, nor throw yourself down to rest with conscious security. In a short time, however, watchfulness becomes habitual; an unusual sound or motion strikes upon your ear or eye unconsciously as it were; your gun is always ready to your hand, and your hand ready to act instinctively, and without interrupting your occupation, or breaking your train of thoughts.

After we had returned to the boat and dined, we saw eight or ten men come out of the bush on to the sands, about half a mile off, point to the boat, make several gestures, and come towards us. We sent a man to a rocky point to call and beckon to them; on seeing which, they ran towards us, and our man returned. When about 200 yards off they stopped, coeyed, and gesticulated, all which we returned, when, seeing them to be without arms in their hands, I, with Captain Blackwood's permission, stepped ashore, and went up to them, with a red night-cap as a present. One man advanced to meet me, on whose head I placed the red cap, and then dancing "corrobory fashion" to each other, we immediately became good friends, and the rest came up. Captain Blackwood and Ince now joined us, bringing some biscuit, and we all sat down and held a palaver, laughing, singing, grimacing, and playing all kinds of tricks. On our lighting our cigars they all called out "medar," meaning, I conclude, fire. Pulling out my powder flask, I made a small train

on a piece of a rock, and set fire to it, at which they were greatly surprised and delighted, and made signs to do it again. Their expression of surprise was a sound like "phut! phut!" but when pleasure or satisfaction is mingled with it, it was "wurrah! wurrah!" or rather, "wur-r-r-r." vibrating the tongue continually. We sent for some brown sugar, with the taste of which they were highly pleased, and swallowed large mouthfuls with great satisfaction. We then invited them to come to the boat, and though at first rather reluctant, when we got in and sat down, and threw some biscuit ashore, they came and sat opposite us, one or two young ones coming down the slope of a projecting rock to the bow of the boat. Presently an old woman made her appearance, of rather a skinny figure, but a sharp, good-natured countenance: she had a grass basket over her shoulder, and a grass necklace round her neck, being her only apparel. She waded out to us with the greatest confidence and good humour, and we filled her two hands with sugar, with which, as soon as she had tasted it, she crammed her mouth as full as it could hold; then giving us her basket and necklace she held out her hands for more. Two or three young girls and two boys now came down. The elder of the other women came down near the boat, but would not come out to us for sugar, on which the old dame offered to take her some. As soon, however, as she got it in her hands she began on it herself, and would have finished it had we not cried out, on

which she went and gave half a handful to the other woman, and then licked her own hands as clean as possible. The youngest and best looking girl we could not persuade to come to us. On beckoning to her to come for sugar she would advance hesitatingly a little way, and then turn round laughing, with her hand before her face, and run behind some of the men, with all the airs and coquetry of a rustic belle, which in her purely natural condition amused us not a little. We then gave some for her to a man who apparently was her husband. He took a heavy toll of it, but on our crying out he let her taste it, when, as she took only a little as if afraid or not liking it, he hastily crammed the remainder into his mouth, as if to settle the business, and seemed to treat our efforts at gallantry with profound indifference and contempt. On my stepping ashore to buy another basket, the young women ran away with the little children, but the rest took no notice. Some of the younger men were very inquisitive about our dress, pulling our coats as if they thought they were loose skin, on which I sat down and took off my boot and stocking, at which there were many exclamations of "Phut! phut!" As I was throwing my stocking to one of the men in the boat, one of the boys, with a very comical air, jumped up and caught it in its passage, on which there was a general laugh: he examined it with great attention, peeping down it like a magpie into a bone; and then, seeing one of our men holding out his hand for it, he pretended to throw it, but suddenly

drew it back again, and all with such humorous gestures as elicited roars of laughter from both parties. At length, however, on my speaking to him, he threw it into the boat good-naturedly enough. We now gave them some bottles and other trifles, on which they offered us their armlets, made of plaited grass, and seemed anxious to find something to give us in exchange. When the sun was getting low, they pointed to it and then to the foot of the hill, and laid their heads on their hands, to shew us they were going to sleep there, on which we laid our heads down in the boat, and then pointed across the bay to tell them we were going to sleep where we were, and were going away in the morning, on which they all rose up and departed together. There were two old men, five middle-aged, and five young men, an old woman, three younger ones, and two children, and we saw another head or two peeping over some rocks at a little distance. These men were not so powerful as those we had seen at Port Bowen, but were well made, active, with generally good expressions of countenance; and, excepting one, who appeared to be an idiot, and had a horrid misshapen head and face, they had no mark of disease or infirmity. All the men had one front tooth out, generally on the left side, but in one or two instances on the right. Their bodies, especially the shoulders and breast, were marked with the usual raised scars or weales. They all said "Barbon," when these were touched, that being, I conclude, their name for them. In some the scars were

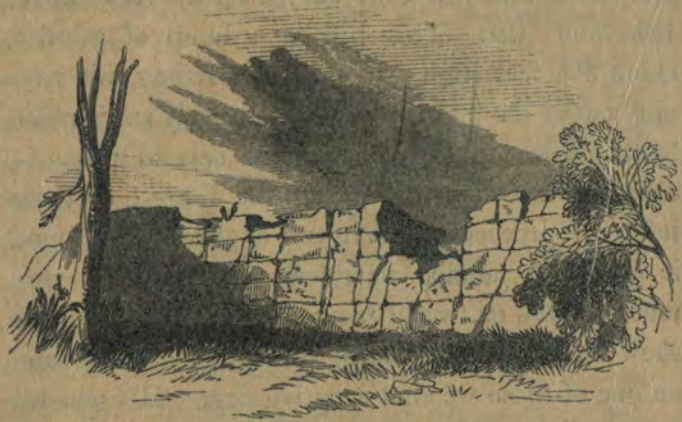
numerous and very large, in others smaller, and they all appeared irregularly arranged, and differently on each individual. Their bodies are singularly erect, and their gestures and motions easy and free, often assuming postures that no European, except a professed tumbler, could throw himself into. I observed one old man to-day sitting for an hour together with his heels close under him, one thigh lying flat out on the ground on one side of him, and the other thigh raised close to his body, with the knee under the arm-pit. Another frequent posture is to stand on one leg, with the foot of the other resting against the knee, and this appears to be a posture of rest. The women are smaller than the men, but of the same make, both being equally lanky, with straight hips and sides and thin legs, so that when viewed from behind at a little distance, it is difficult to tell a woman from a man. The women did not appear to be scarred, or to have lost a tooth. In the old woman the breasts were small, but flat and pendant, and connected by a loose fold of skin. In the younger ones the breasts were full, but small and conical, instead of hemispherical. Their carriage is as erect as the men's, with a kind of strutting gait. The only sign of clothing among them was a small rug, made of two or three opossum skins neatly sewn together: one man held this in his hand.

Their string was made of a tough grass, very neatly twisted, and when a little worn, it looked at first sight very like our twine. Their armlets were

strong string, wound round with a thick thread made of hair, probably that of the opossum, and looking just like worsted. The necklace worn by the old lady was made of the yellow joints of some kind of reed or thick grass, cut into lengths and strung on a piece of twine, and twisted two or three times round the neck. Some of the men, too, had bands of string round the neck or waist, with knots and tassels hanging down, and several had a band round the head among the hair. Their baskets were made of stout grass or rush, very neatly woven together, round and bag-shaped, widening towards the bottom, with a strong band round the mouth, from which was a loose loop of string by which it was suspended round the neck. This tribe was quite the most friendly and communicative we had yet seen on the coast.

On their departure we strolled ashore again before it got dark, and on the top of the ridge near us we came on what in Europe I should almost certainly have set down as a ruined wall. This was a granite dyke, running nearly N. and S. over the crest of the ridge, and for nearly 100 yards it was four or five feet above the surrounding ground and three feet thick. It was jointed so regularly and completely, and by such numerous planes at nearly right angles to each other, cutting it into blocks about a foot square, as to assume the exact appearance of old, rather rude masonry. It was broken down here and there, and its whole appearance was so deceptive, that Lieut. Ince, who was with me, declared it must be a wall: an opinion to which, in any

other country, I should probably have at once assented, without further examination. It was not, indeed, until I detected several *oblique* joints at different distances, cutting through the whole wall and quite parallel one to the other, that I could entirely satisfy myself of its strictly natural character.



The granite did not greatly differ in mineral character from the rest of the rock which surrounded it, but much in its jointed structure, as the neighbouring rock was traversed only by planes at a distance of several feet or yards apart, forming very large cuboidal blocks.

We returned to Cape Upstart on *May 5*, and on the 10th, as the pinnace was not yet quite completed, Captain Blackwood, with Lieut. Ince and myself, set off to look for an inlet on the opposite side the bay to our anchorage, where we had been informed by Captain Wickham, there was a freshwater river. A

low hill on that side was our landmark, immediately north of which we saw a considerable opening, outside of which were very heavy breakers, stretching in a continuous line down the coast for several miles, and a full mile from the shore. Passing through the south end of these breakers, we pulled for the foot of the hill, where we landed on the rocks about 10h. 30m. A.M. This hill is a lump of granite, about 500 feet high. We found a strong tide running out of the bight, which was entirely surrounded by mangroves, among which were several inlets in different directions. Taking the largest of these inlets, we proceeded, but in two or three miles found it getting gradually narrower, and winding very much. One or two little open spaces now began to shew themselves, consisting of hardened mud; and on one of these we shot a native dog. His general colour was a rufous grey above, light yellow below, with white cheeks. He measured:* nose to root of tail, 2 ft. 10½ in.; length of tail, 1 ft.; top of shoulder to ball of foot, 1 ft. 9 in.; girth round the chest, 1 ft. 8½ in.; girth round skull (just before ears), 1 ft. 2 in. He was bold, coming up within 15 yards, and very tenacious of life, requiring four charges of large shot to kill him. He had nothing but lizards in

* A much larger one was killed at Cape Upstart, quite black on the back and sides, tawny yellow or tan on the other parts of the body. He measured:—Length of body and head, 3 ft. 3 in.; tail, 1 ft. 2 in.; girth round chest, 2 ft. 3 in.; height of shoulder, 2 ft.; length of head alone, 9 in.

his stomach. Just beyond, we put up a covey of small brown ducks, that whistled like plovers as they flew over our heads. I was lucky enough to kill one by a long shot, but we did not get back to the ship early enough to preserve the skin. The creek now divided into two, of which we took the left hand branch. A little above this we came on a native weir, in a very narrow shoal part, where we landed at 2 h. 30 m. P. M. on a little grassy flat, surrounded by mangroves, and went for a walk till the flood tide should come up. Pushing through forty or fifty yards of mud and mangroves, we came to a grassy bank, leading to a large open plain, with fine tall grass and light park-like timber scattered about. As soon as we emerged from the mangroves, two natives shewed themselves, and, giving me his gun, Captain Blackwood advanced to meet them. He presented them with his pocket handkerchief, and saluted them by dancing, native fashion, on which they immediately became friends. Two more natives now coming up, Ince joined the party with similar ceremonies, and then I joined them, and having completed the introductory dance, we all proceeded together in a friendly manner; on which a young woman and two boys joined us from the mangroves. We walked on for about a mile, over a fine grassy plain, till we again saw a large belt of mangroves, and a wide sandy space before us. The natives proceeded towards this, where we saw others likewise

assembled at the edge of the swamp. They strongly pressed us to go in that direction, but we thought it more prudent to return to the boat. As the tide was now coming up, we proceeded up the creek, which, however, was now too narrow to permit us to use our oars, so we poled along for about half a mile, till, coming on another small grassy flat, we determined to stop and encamp for the night. While the men were getting the things out of the boat, we walked along a small native track, through a belt of mangroves, beyond which we came out on an extension of the same plain we had been on before. Following on this for about half a mile, we completely headed the small creek we had come up by, and found it ended in a small skirt of mangroves, surrounded by an open, grassy country. In the same line with the creek, however, we found a tract of marshy ground, 200 or 300 yards wide, full of water holes, some fresh and some brackish, with a bank of sand on each side of it; and forming, I have no doubt, a kind of watercourse after heavy rains. Two or three miles north-west of us rose some low hills, with grassy slopes and clumps of trees, and very good grass land seemed to stretch into the interior as far as we could see. As, however, it was getting dark, we hastened back to the boat, having seen no signs, either of kangaroos or more natives. Our little grassy spot was not more than 100 yards wide, surrounded on all sides by thick mangroves; and the sun had no sooner set and we sat down to

eat our dinner, than the musquitoes surrounded us in swarms, and we looked forward to a sleepless night of torment. About seven o'clock we heard a native coey at a distance, and answered it; and about eight we sent the men to the inner mangrove swamp, to get wood for our fire. In order that all might work at this, I took a musket, and volunteered for sentry; and while walking up and down, heard a stick crack in the bush, in the direction of the native path. I immediately walked up that way, and just at the edge of the wood, in the dark shadow of the trees, over which the moon was just rising, I nearly trod on an old man and two or three others that were lying crouched on the grass, watching our movements. They immediately rose, and the old man, with a sort of deprecating murmur and gesture, began to pull out a handful of a kind of ground nuts from a basket slung round his neck, and offer them to me. I accepted them; and, seeing I was inclined to be friendly, two or three others advanced, and we danced a corrobory. Captain Blackwood and Ince shortly joined me, having previously got all our baggage back into the boat, and put a man in her to take care of it. We then invited them to our fire, and found there were altogether seventeen of them. They had no spears, but one old man had a waddy or club, and two or three had boomerangs, some of which were well made, but others were bent pieces of stick, hastily picked up. On coming to the fire we gave them

some biscuit, and shewed them it was good to eat, but they did not seem to admire it much, and the men gave them an old jacket, frock, and trousers, which were divided among three of them. In these they looked ridiculous enough. They had very gentle manners, and their language was soft and vocalic. Their curiosity, however, was too much excited to allow them to give us many words, but I got five of which I was pretty certain.* They mingled among us indiscriminately round the fire, laughing and talking; but we took care to keep one or two men walking about with their muskets ready in case of necessity. One fellow, with a very intelligent mild countenance, attached himself to me, and I christened him Thomas. He gave me his waist-girdle, made of twisted hair, and an ornament from his neck cut out of the shell of a nautilus pompilius. They seemed greatly to admire our Panama straw hats, often touching them, and then pointing to their own heads. One or two of them had a kind of skull-cap of net work, made, I think, of twisted hair. Three "gins" now joined us, two of whom belonged to an old man, and one to another. They were neither young nor good looking, being rather skinny, with flabby breasts. They wore

* Boomerang . . . barbarra.
Scars of the skin . . . mambŏnā.
Beard . . . . . nittigālla.
Eye . . . . . nitté or niddé.
Mouth . . . . . mallăgāna.

necklaces of jointed grass twisted round the throat, and sat down behind their husbands quite easy and confident. I observed, however, that wherever the man moved, his gin moved and followed him immediately, crouching down behind him again; and if he inclined to sleep, putting her foot under his head for a pillow, while she leaned her head on his shoulder, or sat up talking and laughing behind his back. We amused them in all kinds of ways, by shewing them a watch, a measuring tape, a dog whistle; the last especially delighted them, and they begged one after another to be allowed to whistle through it, being greatly pleased when they succeeded. On holding a watch to Thomas's ear, he listened attentively, looked at it, listened again, and then his astonishment got vent in a long drawn cooh! ending in wurhrh! phut! phut! phut! One of our men began to drill two or three of them, and the gravity with which they imitated his motions and words as far as they could, taking enormously long strides when they marched; and then "halt," "right about face," and "march again," afforded us much amusement. One young fellow, however, to amuse whom I had lighted some gunpowder among the grass with my cigar, was more frightened than gratified, and ever afterwards if he turned round and found me standing near him he hastened to hide himself on the other side of the fire as fast as possible. I have no doubt he set me down for a terrible magician. On our men striking up a song

in chorus they listened very attentively, leaning their heads down as if trying to make out the words, and evidently struck with a style of singing so different from their own. When we wanted more wood two or three of them cheerfully assisted to bring it from the swamp. At length we got tired and lay down, and they separated into little knots, each party taking a stick and making a little fire, which they sat over. My friend Thomas established himself by me, strewed some grass for me to lie on, and made a little fire in front to keep away musquitoes; he then sat down close to my back, and began a long whispering communication, pointing to the gins. I concluded he was offering me a wife if I would come up the country and live with him, as he several times pointed to the bush. He sat carefully watching me as I lay trying to sleep, waiving off the musquitoes, bending down the flap of my hat to shade my face from the moon, or adding a stick or two to the fire. I confess I did not return his attentions with becoming gratitude, as I lay with my gun in my arms ready to shoot him if necessary, and once or twice rather roughly removed his head from my shoulder, which he seemed to think he had acquired a right to use as a pillow. Soon after midnight, either because sleepy themselves, or seeing us inclined to sleep, they began to disappear by twos and threes, each taking a lighted fire-stick in his hand, and going off along the path through the mangroves. When they were all gone, by getting the boat's

awning and sails ashore, and wrapping ourselves completely up in them, we managed to get two or three hours sleep in spite of the musquitoes.

May 11.—At 6 A. M., after a cup of tea, we set off for a walk. On getting through the skirt of mangroves we found our friends of last night where they had been sleeping, in a little hollow, and they followed us into the country in single file. Presently the Captain's pointer, Don, pointed at a quail, which on its rising was shot, and fell among the grass. They started, and held back at the report of the gun; but seeing us looking for the bird, two or three came to help us, and on the dog finding him they took it up, examined it attentively all over, and handed it from one to the other with many exclamations of wurrhh, and much earnest conversation arose among them on the circumstance. They presently entered into the spirit of the thing, however, and seeing a flight of crows coming over, they pointed to them, and begged us to shoot them. We took care not to fire except at easy shots, and, luckily, never missed one, which gave them, I have no doubt, a high opinion of our guns. We crossed a very pleasant grassy country towards the hills in the north-west, but in about a mile were stopped by a deep creek, ten yards wide, with muddy banks ten feet high, and a strong tide running up. The water was salt, with patches of mangrove here and there, and the creek fifteen or twenty yards wide. We came here on a native path, following which it

brought us to another bend of the creek, which it crossed and continued on the other side. Here several of them plunged in and waded and swam across, and were very urgent for us to follow. It looked, however, both deep and muddy, and we declined. My friend Thomas continued with us, and also another small man, whom we called Little Jacket, from his having had a jacket given him, and which he now wore the wrong side before, buttoned down his back.

After going some way down the creek, however, and finding we were not inclined to cross, they also took their leave and went over. A little farther on, we arrived at the same open sandy space we had been upon yesterday when we first landed, so we struck back to our boat, for, as we had brought only one day's provision with us, it was necessary to take advantage of the ebb tide to go down. This tribe of natives had no very athletic men among them, and some of them were very short; they were all, however, well made, active, lively, and good tempered. They were all more or less scarred, and had lost one front tooth. Some of the scars were very deep, or rather the raised fold of flesh very much in relief: one man especially had a double fold across his back from his shoulder to his loins, raised fully half an inch above his skin, and each half an inch wide, as if two pieces of rope had been let in under his skin side by side. The women were also scarred, especially over the hips, and had likewise each lost a front tooth.

At eight A. M., it was high water, and all the mangrove swamps were afloat, so that it was sometimes difficult to hit on the right channel. We went down very rapidly with the ebb tide, and in two hours reached the hill at the mouth of the bight. This we had called, from its situation, Entrance Hill. We now ascended it, and from the top saw great beds of mangroves running in each direction along shore, with many inlets among them, and another very large bight about three miles to the northward, running up into the country, which we concluded to be the real mouth of Wickham's River. We could see also a narrow winding creek running from one bight towards the other through the mangroves, and apparently connecting the two.* At 11h. 20m., we returned to the boat, and after a heavy pull through the breakers and across the bay against a head wind, we reached the ship about 4h. 20m. P. M. As we found the ship would not be ready to leave Cape Upstart for two or three days more, Captain Blackwood gave me permission to make another excursion to Wickham's River.

May 13.—Lieut. Ince, Mr. Evans, Mr. Melville and myself, set off in the second gig, with three days' provisions. It had been blowing hard all night, but at five A. M. we left the ship, and sailed

* We had a copy of Captain Wickham's chart of this part, made when he was here in the Beagle, but it had been so hastily and imperfectly copied, that we could not make it out till afterwards, when we found all these features correctly marked down.

across the bay before a strong breeze from the S.E. We made the breakers soon after sunrise, nearly opposite Entrance Hill, and ran down to the northward just outside of them, looking out for the opening of the river. The shore was very low and the breakers lofty, and compelled us to keep so far out that we could only now and then catch a sight of the tops of the mangrove bushes. Twice we attempted to run in, but the rollers were so very heavy that we hauled out to look for a better spot. At last, however, we saw some sand cliffs, which we believed to be on the north point of the river, and then determined to run in. The first roller we surmounted was in about three and a half fathoms. It was very large, and as we rose on to it, it hurried us on with great rapidity, boiling and curling round us, and requiring a steady attention to the helm and sail to prevent its overwhelming us. Once within the influence of these rollers, there was no retreating, and nothing for it but a straight onward course; and we passed over a succession of similar breakers for nearly two miles, the water becoming gradually shoaler, and the waves less lofty but more frequent and broken, so that we took in much water. We had shoaled our water to five feet, when we suddenly saw we were running straight for a smooth beach of sand, and that we had come two or three hundred yards too far to leeward, so watching our opportunity we let go the anchor, swung round, head to sea, got down the mast and

sail, and while two hands baled the boat, we manned all the six oars, and set to work to pull off again. Luckily the flood-tide was setting in from the north into the mouth of the river, so that it gradually swept us up to windward till we opened it, when again watching an opportunity we pulled round, hoisted sail, and in a short time shot round the point into smooth water, and rapidly passed from the roar and din of the breakers into smooth tranquil security. We escaped with the loss of our boomken and with a good wetting; but had we capsized the boat, or swamped her, we should have had the pleasing prospect of starving for several days on a barren beach as the best thing that we could have hoped for. The opening we had now got into was about three miles wide, and we had $3\frac{1}{2}$ fathoms depth about 200 yards from the north shore. There was here a small cliff of sand, about ten feet high, and the land beyond was an open forest country, with green grass and scattered trees. At one spot was a small hill, shewing a cliff of sand fifty feet high. The south shore seemed a great mangrove swamp merely, with a spit of sand running out to seaward among the breakers. In about two miles we came on a small low island, and passed on the south side of it in shallow water, the shoal apparently stretching all across. The tide was running up pretty strongly, and having a fair wind we went on rapidly. About a mile above the island the river suddenly contracted to a width of about a

quarter of a mile, and we observed a narrow opening leading through the mangroves to the south, in the direction of Entrance Hill. Indeed, it may be said, the river properly commenced here, all below being salt water and mangrove swamps. The river now came from the north, running about north and south for nearly two miles, with a depth of from five to ten feet. At the head of this reach the water was perfectly fresh at high water, which took place at 10 A.M. The depth was then thirteen feet, and the width a quarter of a mile. Entrance Hill bore south-east, and the Inner Hills due south. White cockatoos were very abundant here, as were also black cormorants and brown kites. We saw too, several pelicans, white cranes, and herons, some ducks, a native companion, and other birds. We heard several times a singular booming noise, which we at first took for the drumming of an emu, but had afterwards reason to believe it was made by the pelicans. A native dog now came out on the bank of the river, and looked at us very attentively, belonging, I have no doubt, to a party of natives lurking in the woods. From the head of this reach the river curved to the west, and became shallower, leaving the steep cliff and forest land of the north or left bank, and passing over beds and flats of sand and pebbles that occupied an intermediate space, till it struck another cliff and forest land on the south or right bank, when we again got some deep holes. There were many trees and snags

lying in the bed of the river here. The patent log now gave us a distance of seven miles from the inside of the breakers, and we found that it was impossible to take our boat any higher from the shallowness of the water beyond. While trying to drag her over a sand bank we saw eight or ten natives advancing over the sands from the north bank, and one old man came directly up to us. We made friendly signs to him, but determined to make a reconnoissance on foot before engaging the boat in shallow water with natives about; so hauling back into the first deep hole, we anchored under a small cliff where we could easily land. Then taking one man with us, and leaving four armed with muskets in the boat, we took our guns and went ashore to the natives. Eight of them had crossed the river and joined us: they were tall, athletic men, bold and confident in their manners, with energetic gestures and loud voices. One man had his hair dressed in small pipe-like ringlets, with a particularly impudent face and round bullet head, and he held a short stick in his hand, with a knob at the end of it. The rest were unarmed. We went over the small cliff, and then down on to the sands in the bed of the river, proceeding up its course. One of us shot a kite at the edge of the wood, at which the natives started a little, but rather exhibited curiosity than fear, when we gave them the bird to examine. Another small party of natives were on the opposite side of the river with

two dogs, but they were probably women. We walked about two miles over the sand, when we arrived at a slight eminence with some bushes on it, whence we could look up and down the river. The real bed of the river, or the space from one bounding cliff to the other, was from half a mile to a mile wide. From the top of the little cliffs forest land stretched into the interior, the trees close together, and the underwood thick. The intermediate space or river bed contained bare patches and banks of sand, with lines of pebbles, or grassy flats with pools of water and marshy ground. The present stream wound through this intermediate space, from one cliff to the other, with a width of about 200 yards and a depth of about two feet, but with deeper holes occasionally, and sometimes a shallow rapid over a bed of pebbles. The height of the bounding cliffs was from ten to twenty feet above the river, but even on these were marks of occasional inundations, the roots of the trees being matted with drift matter, which was often tangled among the bushes to a height of three or four feet above the cliff. We could see from this spot about two miles further up the river, for which distance its course was north-west, but then it curved gradually round to the west and south.

The natives now beckoned us to the shade of a bush, and, smoothing the sand, made signs to us to sit down, which we did, and they sat down with us. One or two of them had skull-caps of net-work, and one fine young man, with a different cast of coun-

tenance from the rest, his features being Nubian rather than Australian, took his off, and exhibited his hair carefully combed up and back, into a conical, or cocoa-nut form.

Seeing us smear our hands and faces with tar and oil, to keep off musquitoes, they immediately requested some, and leant forward their heads while we anointed them, saying wurrhh all the while. On my saying "meda,"* they immediately answered, "medánè," and picking up two sticks, one of them prepared them for getting a light. He chose a round stick and a flat one, and bit the round one into a rude point at one end. He then offered it to each of us in turn, either out of compliment or wishing to know whether we could set it on fire. On our all declining and making signs to do it himself, he, with a kind of air of superiority, put the flat stick on the ground between his feet, and taking the other between his hands, he began rubbing or twirling it rapidly round, till he made a small hole in the lower stick, which shortly began to smoke, and was just on the point of igniting, when he desisted. In order that we might not be outdone, I now produced a bit of punk and a burning-glass, and calling their attention, lit it by help of the sun; we then lighted our cigars, and made a little fire of sticks, at which they nodded their heads. As soon as the fire was lit, each of them held his hands for a short time in the smoke, and then smeared them over our faces,

* The word I had got for "fire," at Cape Cleveland.

repeating it two or three times. Whether this was a ceremony meant to welcome us to their country, or equivalent to eating bread or salt with an Arab, I cannot tell.

We now got up to return to our boat, of which, however, they highly disapproved, and endeavoured to detain us or to induce us to go further up the river. As, however, we saw others in the distance, coming up, we thought it best to return; but when they saw us so determined, they even laid hold of us by the arm, or took hold of our guns, on which we shook them off and spoke sharply to them, and most of them desisted. Our impudent friend with the stick, however, stuck close to us, laying hold first of one and then of another; seeing which, two or three more came up and joined him in his endeavours. On coming in sight of the boat, we saw a large party of natives assembled near it, and several more here and there in the edge of the woods; all shouting and crying from one to the other. As soon as we came near, the uproar increased, and those with us renewed their attempts to stop us, vociferating all the time at the top of their voices. Still they were mostly unarmed; but we saw one man with a spear and shield at the edge of the bush, and two or three more had waddies and boomerangs, painted red; and knowing how quickly they supply themselves with weapons on an emergency, it was thought better not to go through the wood over the cliff, but to wade out towards the boat, and tell our men to

come for us. The uproar was now very great, and seeing one or two behind me, kicking up water at us with an evidently contemptuous motion, I fully expected we were going to have a scrimmage, and resolved to shoot our impudent friend with the bullet head and shillelah the very first man. Just as we were stepping into the boat, however, a little man came pushing down through the crowd, whom Ince and I recognized as Little Jacket, one of the men we had seen two days before, and immediately made signs of recognition to him. He was very busy talking to them about us and pushing them back, pointing to our guns, and begging them, apparently, to let us alone. The lead line having been used as a stern fast, was left on the bank when the boat shoved off, and one fellow was just picking it up, when Ince presented his gun at him, on which he dropped it and ran off. Every thing being now in the boat except that, we dropped down for it, and sent one hand to bring it off, when we shoved off into the stream about twenty yards, and then came to an anchor to change our clothes and get something to eat and drink.

Having now leisure to look about us, we shortly recognised several others of our old friends, and among the rest my friend Thomas, who was ornamented or disguised with a broad band of red paint across his cheeks and nose, and smeared over his breast and body. We found now that there were two tribes present; that the first comers, who had

joined us from the north side of the river, probably belonged to that district; and that, while we had been absent, the other tribe had come up to the boat from the south. It was probably the jealousy between the two tribes, or the ceremonious introduction at meeting, that had caused all the shouting and uproar, which we had taken for preparations for hostility. None of the south tribe appeared to be armed, though several of the others were. We called the latter the Cockatoo tribe, from their wearing white cockatoo feathers stuck in their hair. Several on both sides were smeared with bands of red or white paint. The two tribes sat apart from each other, our old friends on the cliff above the landing place, and the others on a flat a little farther up the river. We saluted our old friends by dancing, on which they began dancing, laughing, and singing, the others sitting still and looking on. As soon as we had dined we went ashore again, and our friends rushed down to meet us. Thomas came up, and embraced me several times, making a purring noise; and whenever a new face came up, he put his arm round me again, and spoke to him; introducing me, I suppose, as his particular friend. Ince, Melville, and I went with them along a path-way down the river, and both tribes followed us. They were very gentle in their manners and careful of us, one man going before each of us and stopping whenever he came to a hole or a stump among the grass, and pointing it out, in order that we might not hurt our-

selves. Thomas, who, had he been washed, would have been a rather good-looking fellow, tall and well made, had really graceful manners. We had a small flask of brandy and water with us, and offered them some: they all declined; but seeing us press it, he took the cup and raised it to his lips, and then returned it with an inclination of the head, saying something with a smile, which we interpreted, "I am not thirsty, thank you." They had none of the clothes which we had given to them the other day, and, on our inquiring, they pointed to the south, as if to say, they had left them there at head quarters. "Little Jacket" had a string round his waist, from which there hung down in front a bunch of strips of opossum skin. On pointing to them, he said, "unagua;" and Thomas, pointing to some cuts in a tree (made by the natives in climbing to hunt for opossums), likewise said, "unagua," which I suppose, therefore, to be their name for that animal. We had a dog with us, which they always called "alingo;" very similar to the common word "dingo," which, I presume, was derived from the tribes in the neighbourhood of Sydney. They could not pronounce our words very well, and, if they ended in a consonant, always added "o" to them, as "hato" for "hat." Their own language was remarkably soft and vocalic, without that iteration of the same sound usual in Australia; and they spoke earnestly, rapidly, and with a continuous flow of words. After a walk of half a mile, we sat down

on an open, grassy space in the river bed, and the Cockatoo tribe having joined us, formed quite an animated scene. Melville made a portrait of Thomas, during which he was tolerably patient and very tractable, putting himself into the required attitudes, aud when the sketch was finished, complimenting it with a long wurr-r.

We observed one of the Cockatoo tribe with a dirty bag over his shoulder, which on examination proved to be made of a piece of a damask table-cloth. He pointed to the sea-coast, but we could not make out whether it was given him by a white man or was cast ashore. He probably, however, had got it from the Beagle. One man attempted to pick Ince's pocket of his handkerchief, but was terribly alarmed on his taking up his gun, and the rest interposed to beg he would not shoot him. On our returning to the boat, Thomas and two others only accompanied us; and as we went away, a great shouting and confusion arose among the rest, which was probably occasioned by the Cockatoo tribe taking leave, as they shortly crossed the river to the north. On getting back to the boat, we added a piece of looking-glass to our other presents, with which they were highly delighted, each one as he looked into it holding up his chin, twisting his face, opening and shutting his eyes, screwing his mouth about, and contorting his countenance in such a manner as convulsed us with laughter, especially as they preserved the utmost gravity all the time. One of

them pointed to Ince's chin, which had been recently shaved, and then to his own straggling beard, as if begging to have it cut off, and he submitted quite patiently while Ince cut or rather sawed it off with his pocket knife. They expressed a wish to go into the boat with us, and sat down very quietly while we hauled off into the stream, only making signs for the guns to be put away on one side. Presently the rest of their tribe came down, and seeing them in the boat were very clamorous, either to come in themselves, or for them to come ashore again. As it was now sunset we accordingly hauled in, and they immediately landed, and we wished them good night. We then proceeded a little way down the stream, in order to get into a clear open space, below the shoals, in which to anchor for the night. Seeing us stuck on a sand-bank, and all wading in the water, six of them came off and lent their assistance to get the boat over. It was now low water; so when we came to a spot where the general depth was three feet, and were out of spear-throw from each bank, we anchored. After dark we saw several fires lit on both sides of us at the native camps. At 10 P.M. it was high water, and we had then a depth of ten feet, and the water very slightly brackish.

May 14.—At daylight we made preparations for our return. To this we were induced by our uncertainty as to how we should get out of the river, whether we could find another passage out, or if

not, how long we should have to wait for the sea to go down on the bar by which we entered, sufficiently to enable us to pull across it. While bathing we saw three of our friends on the south side of the river, and one man came down on the north bank, and watched us for some time. When we got under weigh we pointed down the river, and our three friends proceeded in that direction, but we soon lost sight of them, and did not see them again. When we reached the cliff on the north bank of the river, I landed, and walked down some distance through the bush. The soil was principally sand, very uneven, full of holes and hollows and dry water-courses, as if very subject to inundation. It was covered principally with sedges or coarse grass, but the timber overhead was rather fine and lofty, close and leafy, with considerable variety of wood. There were many pigeons and parrots, but I did not succeed in getting a shot at any of them, and shortly returned by a native path to the boat. We then crossed the river, and breakfasted at the edge of a large plot of grass, in which were many pools of fresh water, and whiled away the time till the tide should turn by looking for wild fowl, which however we did not succeed in finding. At 11 A.M. it being high water, we manned all six oars, and set off down the river. On getting down to the branch that led away to the south, we came on three gins, fishing at a weir that stretched across it made of sticks. They were up to their middles in water,

and very much alarmed on seeing us, and snatching up their nets hastened through a thin belt of mangroves into the bush, one of them carrying a very fine fish in her hand. Notwithstanding the tide was running out of this branch, we determined to try it, so pushing through the weir, and poling for about a quarter of a mile over a shallow sandy flat, we came to the mouth of another channel coming down on our right, 100 yards wide, with a strong stream of brackish water running out of it. This stream divided, part running down the small branch we had come up, and part following a channel which wound round on our left hand towards the south. This we determined to follow, but seeing a grassy bank before us, I landed for a short time, and crossing a little swamp, got on to a fine grassy plain, with light timber, over which I could see the hills near which we were on the 11th, and which we had christened the Inner Hills. I concluded, therefore, that this fine plain was continuous at the back of the mangroves from one place to the other, in which case there must be a considerable quantity of very good land (*for Australia*) within a slight distance of the sea. Returning hastily to the boat, lest we should lose the tide, we pushed on with a rapid current, and continued our course through a very winding channel among mangrove bushes, with arms going off in two or three directions. At several places we had to jump out and drag the boat over sand patches, but in about two miles got into a deeper

channel with muddy bank. On one of these, at a sudden bend, we came on a flock of brown and white ducks, and wounded one, but after a vain chase over a mud bank, from which we had some difficulty in extricating ourselves, we gave him up. Our channel now got broader and deeper, and eventually led us out into the southern bight, where, about 2 P.M., we anchored under Entrance Hill. This bight was now a mere tract of mud banks, with shallow channels, and it is doubtful whether we could have found one deep enough to allow of our boat passing out at low water. After a walk over the hill where I shot some common blue mountain parrots, and a fine grey and white eagle, we dined, and awaited the ceasing of the flood-tide, which was running past us at the rate of four or five knots an hour. At 10 P.M., this having ceased, we went down to the outer point, where we anchored for the night.

May 15.—At daylight the water was quite smooth, with a light air of wind off the land. We took advantage of it accordingly, and pulled out, a slight swell only marking the place of the usual heavy breakers at the edge of the bank. We then hoisted sail, and lay up the bay with a land wind, which, as the sun rose, gradually drew round by the south, heading us off continually, till we had the usual strong south-east breeze. By this time, however, we were far enough into the bay to fetch the ship, which we reached about 10 A.M.

May 16.—The pinnace was launched this morn-

ing, and named "The Midge." She was now cutter-rigged, with a kind of shifting deck, and a much more sea-worthy craft than before, though still sufficiently wet and uneasy.

May 17.—At 2 P.M. sailed from Cape Upstart, with the Bramble and Midge in company. The weather for some time past had been very delightful, the average temperature during the day not being above 75°, with a clear sky and pleasant breeze.

CHAPTER IV.

ROCKINGHAM BAY—GOULD ISLAND—MOUNT HINCHINBROOK—PASSAGE INTO HALIFAX BAY—RANGE OF HILLS ON MAINLAND—STREAMS OF FRESH WATER—NATIVES AT FIRST FRIENDLY AFTERWARDS HOSTILE—LIST OF NATIVE WORDS—ENDEAVOUR RIVER—GEOLOGICAL STRUCTURE—LIZARD ISLAND—GRANITIC PUMICE PEBBLES—SLEEP ON ITS SUMMIT—SEE OUR SHADOWS IN THE FOG—COMMENCE THE SURVEY OF THE NORTHERN END OF THE BARRIER REEFS—CAPE MELVILLE—APPARENT FRIENDSHIP BUT TREACHEROUS ATTACK OF NATIVES—ASPECT OF REEFS—DEEP WATER OUTSIDE—LAND ON CAPE DIRECTION—TREACHERY OF NATIVES—DEATH OF BAYLEY.

May 19 to *June* 1, 1843.—THE next part we visited was Rockingham Bay, where we stayed a fortnight surveying. We anchored near Gould Island, where we were supplied with abundance of excellent water, from several perpetual rills that trickled down the rocky sides of the hill, and traversed a small plain at its foot. The peak of Gould Island is nearly 1,400 feet above the sea, and it appears to be an excellent condenser of the moisture of the S.E. trade wind, as a wreath of cloud often rests upon its summit. To the S.W. of it, about five miles distant, is Mount Hinchinbrook, about 2,500 feet in height. This is the most singularly broken mass of hills I ever saw, covered with rugged knolls, and sharp inaccessible pinnacles, and furrowed by deep and precipitous gullies and ravines.

It is cut off from the mainland by a narrow channel or arm of the sea, as was suspected by Captain King. This arm was explored in a boat by Lieutenant Shadwell, Mr. (now Lieutenant) Porcher and myself. Its southern opening is unfortunately blocked by a sand bar covered with breakers, and its northern entrance has a great dry sand-spit on one side, and only a depth of three fathoms on the other at low water. Inside, however, there is often from six to twelve fathoms depth over a large part of the channel, it is perfectly land-locked and sheltered from all possible storms. It is surrounded by a broad border of mangroves, which, towards the south, stretches far into the flat land behind Halifax Bay. On the main land an unbroken range of high land, none of which is less than 2,000 feet in height, stretches along shore, as far as we could see, to the southward, and after sweeping round Rockingham Bay, rises and spreads to the northward into still loftier and more broken and mountainous elevations. The summit of this range, near Rockingham Bay, is very level, but there are many projecting buttresses and ridges on its seaward slope, which is everywhere very steep, and seems furrowed by many gullies and ravines and narrow-winding valleys penetrating its sides. From these flow several streams of fresh water; one of which, in the north-western part of the bay, explored by Captain Blackwood, is stated by him to be of considerable size. Two others, traced by Lieut. Ince, Mr. Pym, and myself, after winding

about among very thick jungles growing on mud flats, ended without assuming any feature of importance.

The natives of Rockingham Bay are very numerous. Those of Gould Island have been mentioned, and their peculiarly formed canoes and paddles described by Captain King. We found them very friendly and familiar at first, and they were in the habit of coming off every day to the ship, and having presents of food and other things made to them. So much confidence was placed in their good disposition that our boats' crews at last neglected to take their arms with them when they went ashore for water or to haul the seine. On the very last night of our stay, however, after catching a good haul of fish in the seine, and distributing some of them to the natives, they were suddenly assailed, as they were dragging the boat into deep water, by a shower of spears and stones from the neighbouring bushes. Mr. Weekes, the boatswain, who was in charge of the party, was knocked down by a large stone, and so much hurt as to be laid up for a week afterwards. Luckily, one of the men had a fowling-piece, and after firing his piece without producing any effect, a ball was found in the boat, with which one of the foremost black fellows was shot, and the attack immediately ceased.

While away with Lieut. Ince and Mr. Pym, in one of the creeks on the north side of the bay, we were at one time surrounded by several parties of natives, amounting to forty or fifty in number, and

one party commenced pelting us with large blocks of rough basalt, but desisted on a charge of No. 4 shot being fired at them. At the time the gun was fired, the group were not more than forty yards off, and the man who was principally struck, after giving a slight start and scream, shewed the marks on his breast and arms to his companions, and then going to the water and washing off the blood, seemed to think no more about it, but walked about afterwards with perfect unconcern.

In the arm behind Mount Hinchinbrook, Shadwell and myself fell in with several small parties of natives, but they seemed quite peaceable and well disposed. One party had a very excellent bark canoe, capable of carrying several men, equal in point of workmanship to some of the smaller bark canoes of North America. It contained five men when we saw it, and instead of the bits of bark held in the hand, which are used for paddles by the natives of Gould Island, these people had long wooden paddles, with a handle and a diamond-shaped blade, like those we afterwards saw in Torres Strait.

Mr. Evans, master of the Fly, procured the following words from the natives of Gould Island, taking them carefully with the proper precautions.

Finger - - -	manté.	Beard - - -	tàlba.
Eyes - - -	kiāka.	Neck - - -	tencol.
Teeth - - -	eera.	Thumb - - -	campé.
Nose - - -	wooro.	Breast or chest	woko.

Arms - - -	pankal.	Coloured pigment on body	markăra.
Hair - - -	kiāram.	Water - - -	kamo.
Foot - - -	pinkan.	Fire - - -	wampoe.
Ears - - -	aspinna.		

June 2, 3.—We were sailing along shore to the northward, with beautiful weather. The coast consisted of bold ranges of rocky hills of various and picturesque outlines, rising to a height of two and three thousand feet, and even more.

June 4.—This morning we hove to off the mouth of Endeavour River, and I accompanied Captain Blackwood to look at a spot that was to us classic ground, and the name of which, as the spot where Cook careened and repaired his vessel, was associated with my earliest boyish recollections of books of voyages and travels. Its external aspect is bare and barren—rocky hills of moderate height, with their seaward slopes, almost utterly destitute of vegetation. Inside, the inlet expands a little. The north shore is formed of a low line of sand dunes beneath the higher hills. On the south shore a hill of moderate elevation, tolerably clothed with small gum-trees, slopes down on to a small grassy flat, fronted by a line of mangroves, which gradually increase in width and density as they stretch up the inlet. Beyond these the land is low for some miles, and is backed by some tabular flat-topped hills, a few hundred feet high, of a different aspect to those usual on the coast. We found the steep beach marked A in Cook's chart still pretty open, but the spot

marked B, where he careened his vessel, was quite overgrown by mangroves.

We could find no traces either of his visit or the more recent one of Capain King, not even the mark of an axe on a stump of a tree. There was very good water in the little watercourse behind (B.) Parrots, doves, and other small birds were abundant, and the little plain was as pretty and convenient a spot as any we had seen on the coast.

The hill is composed partly of granite and partly of a dark schistose rock, apparently resting on or abutting against the granite. This schistose rock is one of those varieties for which it is difficult to find an accurately descriptive name: perhaps a laminated quartz rock or flinty schist would most nearly describe it. We did not stay long, as our visit was one merely of curiosity. In crossing the bar of the inlet, we found twelve feet on it at noon.

We then proceded to Lizard Island, under which we anchored in the evening.

June 5.—Lizard Island is composed entirely of granite. It consists of one bold hill nearly 1,200 feet high, and some smaller ridges to the west, between which is a pretty grassy plain. Pumice pebbles were found on this plain at least one or two hundred yards back from the sea, and several feet above any possible tide. It is rather destitute of wood, which was a relief to us after the forests we have always been hemmed in by, and the plain abounded with quail. On this plain is a freshwater

swamp, from which a small brook runs out to the beach, on the north-west side of the island, where there is a cove with very good anchorage, and where vessels may get abundance of wood and water for their use with great convenience. In the afternoon I accompanied Mr. Evans and a party to the top of the hill, where they intended to pass the night, in order to get angles from the summit in the morning. We found the hill rocky and rather steep, but reached the top at 5 P.M., and established ourselves in a small hollow, under the shelter of some large stones. We took up two barometers in order to find the height, taking observations both in going up and coming down.* We thought it prudent to post sentries during the night, and from eleven to twelve was my watch. The night was clear and beautiful, and the hour passed quickly as I leant against a large block of rock on the border of a precipice several hundred feet high, looking down upon the motionless expanse of the surrounding sea, into which the setting moon was just descending in the west, the light of

* My barometer was of Englefield's construction, No. 2, rel. cap. =1.58, neutral point = 29.800, temp. 70°.

The other belonged to the ship, M. 106, Newman's construction, rel. cap. 1.50, neutral point = 30.257, temp. 60°, capillary attraction = + .040.

The observations were—

Sea beach 3h. 15′ P.M.	No. 2, J.	B. 30.038	Ad. Th. 82	Do. Th. 80.5
	M. 106.	30.006	,, 86	,, 80.5
Top of hill, 5 P.M.	No. 2, J.	B. 28.875	,, 81	,, 75.5
	M. 106.	28.823	,, 82	,, 75.5

our fire glimmering on the rocks and bushes about, and utter silence in the air around. It was from this hill that Cook, after having repaired his vessel, came to cast a look on the dangers that yet surrounded him, and from which he hoped here to see a method of escape. How little could he have foreseen that in so short a time a British empire would be founded on the shores he had then first discovered, and that this reef-environed coast, dangerous though it be, should be in the daily track of vessels! We were now going to commence marking out a more secure road through some of these reefs and shoals, and hoped in some degree to modify their danger. Such labours of detail, useful though not brilliant, are all that Cook and the illustrious navigators of old have left for the moderns to aspire to.

June 6.—At daylight we found our blankets wet through with the dew that had fallen. The sun-rise was a magnificent one: the morning calm, the sea like one of molten lead, with its horizon quite indistinguishable, or melting into the air, which was rather hazy, with a low bank of clouds. A few miles to the eastward of us we could just perceive upon the water a broken white line, curved and indented, and running to the horizon on either hand; this was the surf breaking on the edge of the Barrier reef. As the run rose, the morning mists began to creep up the sides of the hill, at first in light curls, but shortly after in dense folds of vapour, that ga-

thering and sweeping round the summit of the hill, opening and closing here and there, greatly enhanced the beauty of the view, both of our own island and the neighbouring rocky islets, but effectually hindered all surveying operations. Soon after the sun rose, and while his beams were nearly horizontal, we observed a very curious and interesting phenomenon. Whenever a bank of mist rested on the western brow of the hill, and the eastern one was clear, we could see our own shadows on the mist, surrounded as to the head and shoulders by a faint iris or rainbow. By watching attentively, all our movements could be discerned in these spectral figures. On extending the arm, I found its shadow reached beyond the halo that surrounded the head. By getting on a rock, the whole figure was perceptible, and each person thus saw his shadow standing in the air, apparently at a distance of about fifty yards from him, with its head surrounded by a halo of glory. I do not exactly recollect, but I believe no one, unless standing very near to another, could see more than his own shadow, which, from the nature of the phenomena, I conclude would be the case.

About seven o'clock we heard native voices below us, and coeyed to them, and shortly perceived in a gully, some hundred feet below us, a party of five men and some women and children. They shouted to us, but did not come up, nor did we get any communication with them afterwards.

At nine o'clock, finding the mists not likely to

disperse, we went down, having got all the observations that were essentially necessary.* Soon after getting on board, we weighed and sailed for Direction Island, to pick up Captain Blackwood, who had gone there in his boat yesterday.

June 7 to 17.—During these ten days we were surveying the outer edge of the Barrier reef between Lizard Island and Cape Melville. We caught a great many fish, of a kind called by the seamen rock-cod. They were not cod of any kind, being spiny-finned fish, but of what precise description I cannot say. Some of them were of very large size, one weighing 115 lbs., 4 ft. 10 in. long, with a girth of 3 ft. 4 in. They had large mouths, and were of a white and brown colour, spotted with black.

June 17.—I went ashore with Capt. Blackwood and Mr. Mackay, a mile or two south of the point of Cape Melville, just inside a little islet. Cape Melville is all granite, and covered with huge loose blocks of that rock, and a very dreary, broken,

* The barometical observations were:

Summit of hill 10h. 30′ A.M.	J. No. 2.	B. 28·932	A. 78	D. 75.
	M. 106.	B. 28·865	A. 79	D. 74.
Sea beach. 10h. 30′ A.M.	J. No. 2.	B. 30·106	A. 87	D. 81·5.
	M. 106.	B. 30·057	A. 87	D. 11·5.

The results calculated were, ascending . J. No. 2 . 1161 feet.
„ M. 106 . 1177 „
descending . J. No. 2 . 1145 „
„ M. 106 . 1166 „
Mean of the whole . . . . . 1162 feet.

rugged-looking hill it is. We had hardly entered the skirts of a small wood behind the beach, when we heard the men in the boat calling to us, and looking round, saw, on a rocky height not far on our left hand, some natives watching us. We accordingly returned, and climbed up the rocks to go and speak to them. On seeing this they retired to another ridge; and on our again advancing, to another hill. Whereupon we stood still, and Captain Blackwood, advancing alone, one or two of them then came forward, and waved to him to put down his gun, which he did, and they then put down their spears, but did not come far away from them. As there were six or eight of them, I did not like Captain Blackwood's being unarmed among them, so giving Mackay my gun, I advanced quietly, picking up Captain Blackwood's gun as I went along, and they at last allowed us to approach them with our weapons. They were fine active fellows—tall, well-limbed, upright, the hair short and curly, as also the beard, no front teeth wanting, and the scars few and small. They were smeared with broad bands of brown or yellow ochre, both across the face and body. They seemed gentle in their manners, pointed to their mouths and down into the neighbouring gullies, as if to intimate that there was water. I gave them a necklace of glass beads, at which they expressed great delight, and insisted on shewing us

the water.* In going down the hill, one attached himself to each of us, pointing out the sticks and stones that were concealed by the grass, lest we should hurt ourselves. In the little valley we found a small rill of excellent water, and they seemed quite pleased to see us drink. They often pointed to Captain Blackwood's dog, and said "angooa," which I conclude is their name for that animal. We seemed, indeed, excellent friends, when, unfortunately, I took out a cigar and lighted it with a flint and steel and tinder. At this they all retired, except one, who, the moment he saw smoke coming out of my mouth, ran off too. We laughed, and called them back, but as the sun was setting, we could not wait, but returned to the boat, while they followed at a distance on the rocks above. Before we got into the boat, we discharged our guns, firing them along the water, the natives watching from the top of the rocks, about two hundred yards off. Hardly, however, had we stowed them away in the lockers and made sail, before a spear fell in the water close by us, and, immediately after, another. On this we tacked, and getting our guns out, I loaded one barrel with ball and another with buck shot. One fellow was standing on a rock about eighty yards off, between two small trees, with another peeping behind him, being those apparently

* From this, and the nail-headed spear they had, it is probable some vessel had once been here for water.

105837

who had thrown the spears. Captain Blackwood told me not to hit him if I could help it, but to let him hear the ball; and I struck off a small branch a foot or two above his right ear, on which he bounded into the bushes like a stag. They halted again on a slope about 150 yards off, and to convince them they were not out of our power, I gave them the buck shot, firing high that it might drop among them, on which they all disappeared. We picked up one of the spears, which was rather a savage affair. Into a piece of slender bamboo cane, six feet three inches long, was inserted a piece of heavy wood, two feet seven inches long, the junction very neatly and firmly secured with grass and gum. This piece of wood tapered gradually to a fine point, on to which was fastened by a fine grass line an old nail, very sharp at the point, and the head hammered flat and sharp, and bent up a little so as to serve for a barb; behind these again were two other barbs, made of the spines got from the tails of the sting-ray. All these were so secured by fine grass and gum, that, while quite firm and immoveable against any ordinary force or resistance in entering any body, a much less force would tear them off, if endeavouring to withdraw the spear. Altogether I would prefer a musket-ball as perforator in any part of the body. What could be their reason or motive for this piece of treachery we were at a loss to understand. They may have been injured by white people before us, or it might have been an indivi-

dual whim or caprice, or perhaps merely the elastic bound of fear recovering at our departure.

June 20.—We passed out this morning through a small opening in the Barrier Reef, near Cape Melville, and ran down on the outside of the reefs, running in again in the afternoon, and anchoring under the lee of a sand bank, on which I was able to land. This reef was about two miles long and one mile broad, completely covered even at low water, except just about the sand bank, which was on its shoalest point on the leeward or N.W. extremity. The sand was wholly calcareous, grains of triturated corals and shells; many crabs burrowed in it; small sharks and sting-rays were cruising about in the shallow water, and a few sea birds flying over head.

The shallow water of the reef was of a pale grass green, while the deep water all round it was of the dark ocean blue, the boundary line between the two colours being clear and sharp. On the windward side, or towards the open and unfathomable sea, the swell broke upon the reef in a huge roll of surf, while inside, where the water was not more than fifteen or twenty fathoms deep, there was only the surface ripple flaked with spray, from the action of the strong S.E. trade, which was blowing half a gale of wind. The outside edge of the reef was of course unapproachable, but the inside edge I examined as we passed it. The reef sloped gradually at its edge from a depth of one or two feet to about four

fathoms, or between twenty and thirty feet. At this depth the white sandy patches at the bottom could be distinctly seen among the large dark masses of living coral. Immediately beyond this the lead sank to ten fathoms, where nothing could be seen but the deep blue of the water. The outline of this inner edge of the reef was irregularly indented by spaces and narrow crevices, as it were, of blue water, sometimes only a foot or two wide, and penetrating several yards into the body of the reef, as if this were an overhanging ledge, and you could see through it into deeper water below.

June 21.—In going out of the reefs this morning by the opening we came in at last night, we sounded immediately at its mouth, as soon as we could do so with safety, but got no bottom with 280 fathoms of line. In the afternoon we ran in and anchored under a reef with another sand bank on it. These sand banks are invariably on the lee side of the reef they are upon, which shows the nature of their origin. They are composed of the washings of the broken coral swept by the tides and winds towards the lee side of the reef, until that is made the shallowest, then, when this is dry at low water, the sand is piled up by the wind into a heap with a sloping bank, till it is at last reared above high water mark.

June 24.—The Bramble being despatched to the mainland in order to measure a meridian distance between the Barrier and Cape Direction, I seized

the opportunity of accompanying her. I had only time to take a pair of walking boots and a hammer, having stowed my gun away, as there was nothing to shoot upon the reefs. Yule however lent me a double-barrelled gun that he had bought from a merchant vessel. It was a Belgian piece, and not a very trust-worthy looking affair: however, I spent the afternoon in cleaning and putting it to rights, getting some English caps filed down to fit the nipples, and after firing it once or twice I thought I might depend on its going off at all events. We ran in some distance over clear ground, but on approaching the shore passed through some coral reefs, with sand banks on them, which we threaded till we got into King's track, when we ran past Night Island, and anchored at sunset off Cape Direction. We came to, about three miles from the shore, as it was very shoal inshore of us, and were then only in three fathoms water, with a bottom of green mud. This mud when dried was wholly calcareous and soluble in acids.

June 25.—At daylight this morning we saw a large canoe near us with two men in it fishing. We shouted to them, and after some hesitation they came alongside, and although they would not come on board, they frankly handed up to us their spears and other things, in exchange for bottles, biscuit, and ribbon, having apparently communicated with Europeans before. The canoe was more than 20 feet long, made of a tree very much hollowed out,

with the top sides tumbling well home. At both bow and stern was a projecting ledge, overhanging several inches. It had an outrigger on both sides, formed by laying a pole across the midship part, and another across the stern, projecting six or eight feet on each side, and fastening to the ends of these poles, which bent down so as nearly to touch the water, two flat boat-shaped pieces of light wood, about eight feet long, looked like two little boats parallel to the large one. Their paddles were diamond-shaped in the blade, with long handles, so that they might be used by a man standing up. A coil of neatly formed rope lay in the bows, spare paddles, outriggers, spears, throwing sticks, small twine, fishing gear, large shells for baleing, lay in the boat, everything neatly fastened into its place by a bit of line. The men were tall, well made, with rather high square foreheads, the hair cut short, and small straggling beards. They had each lost a front tooth, had a few horizontal scars upon the breast, and small epaulet-like* scars on the shoulder. In one man the rim of the right ear had recently been cut, so as to form a wide loop, the edges of which were still unhealed. The other had the lobe of his right ear pierced, and hanging down in a narrow strip to his shoulder. They were quiet in their manners, and seemed perfectly frank, open,

* This is the first mention I found made in my note-books of that oval shoulder mark, which we afterwards found universal in Torres Strait, from Possession Isles to Darnley Island.

and friendly. We made them many presents, and after an early breakfast, Lieut. Yule, Dr. M'Clatchie, and I, in one boat with four men, Messrs. Pollard and Sweatman, with five men, in another, prepared to go ashore. All the party were armed except Mr. Yule and Messrs. Pollard and Sweatman, who had the chronometer, sextant, theodolite, &c. to attend to. In landing, we found a slight surf upon the beach, and accordingly anchored the boats and waded ashore, leaving two men armed in each boat to take care of her. Mr. Yule was lame with rheumatism, I therefore volunteered to look after the natives, while he attended merely to his work. At the back of the beach rose some low crumbling sand cliffs, about 40 feet high, above which was a gentle slope for two or three hundred yards to the foot of the hill, which was steep and rocky. This slope was rather uneven, and covered here and there with small scrubby bushes. On the right hand, as we went up, was an open hollow, and on our left a deep little gully, full of low dense scrub, apparently quite impenetrable. The hill was composed of granite, with many large loose blocks upon its sides, and its top was about 400 or 500 feet above the level of the sea. Soon after we reached the top our two black friends joined us, having followed us ashore in their canoe, and whilst the observations were being taken M'Clatchie and I kept them in good humour at a little distance, by talking, laughing, and dancing as usual. The country on the other

side of the hill was low and level, covered with short thick wood, with many bare sandy spaces towards the sea, round which were mangroves. Some low, level-topped hills swept round this flat, a few miles back, and at the back of Lloyd's Bay, but there was nothing pleasing or inviting in the aspect of the country. The natives wanted us very much to go down the hill into the woody plain beyond it, and "coeyed" frequently in that direction. These coeys were shortly answered, and we heard voices approaching the foot of the hill, though we could see no one for the trees. At half-past nine Yule had taken his observations for the longitude, but wished to stay and take the latitude at noon. On second thoughts, however, we judged it best to return to the boats and take that on the beach. While the instruments were being packed up, another young black fellow, unarmed, suddenly joined us from below, and we saw four or five more walking towards the boats across a little open plain on the other side the scrubby gully, by the side of which we had come up. The three with us, after saying something very earnestly, immediately ran down, and in a very short space of time we saw them all in the water round the boats. The instruments being packed up, we hurried down, but Yule was so lame, and the descent so rough that his progress was necessarily slow. When about half way down, hearing some shouting below, I ran forward to a projecting rock, and saw that the natives had

left the boats, but three of them were on the scrubby slope below, going down to them again. I shouted to them, on which they halted, and I hastened down with M'Clatchie and two men to see what they were about. On coming down to the slope, clear of the bushes, we found the three men we had seen before, on our side of the gully, one of whom had a spear, and four men on the other, apparently all with spears. There was much shouting from one party to the other, and one man pointed to and laid hold of me several times, but I did not suppose they would have the audacity to attack a party numerically superior to themselves. When, however, on M'Clatchie's asking the man to let him look at his spear, he gruffly refused, and they began stealthily to retire, one by one, along the edge of the gully, into the bushes which our party were coming through, I began to be half suspicious of their intentions, and saying to M'Clatchie, "there is no harm in being too cautious;" and telling the men to halt for the stragglers, I walked back to look for Yule. After meeting the rest of the party, and telling those unarmed to get out of the bushes, which were thin straggling trees about eight feet high, I met Yule limping along, and asked him if there was any one behind. "Yes," said he, "one man," whom I immediately saw pushing through the bushes, about fifteen yards from me, and a little on my right. He had his musket under one arm, and the artificial horizon box under the other. At the

same time I saw a black fellow standing in the bushes about twenty-five yards from me, and a little on my left. I called to our man to come on, and looked towards him to enforce it by gesture, and on turning my eyes again to the black, I saw him with his spear quivering over his head fixed in the throwing stick, and in the act of taking aim. I had my gun cocked in my hand, and immediately drew both triggers, but, alas! they both missed fire, the spear flew, and our man fell. The black fellow paused an instant, looking intently to see if his spear had taken effect, giving me time again to cock both barrels and cover him, but with the same ineffectual result, when he dived into the gully at his back and disappeared. Yule, who, when I met him, had guessed there was something wrong by the tone of my voice, and stopped, ran forward to pick up our man, whose name was Bayley. After rushing to the edge of the ravine, shouting for muskets, and finding no black fellow to be seen, I went to him and found Yule breaking off the long end of the spear, which was deeply fixed in the back between the shoulder blades, and the poor fellow writhing on his hands and knees in great pain, begging us to take it out. This could not now be done, and on M'Clatchie saying he must be taken on board first, he was carried down to the boat, while the Doctor and myself, with another man, kept guard at the edge of the ravine. In order to try my gun, I fired into the bushes of the ravine,

and this time, although I had done nothing to it, not even put on a fresh cap, both barrels went off.* I had hardly loaded again before we saw the black fellow emerge from some bushes on the other side the ravine, and walk across a sandy plain about 150 yards off, with a jaunty step, as if congratulating himself on his prowess. Three bullets whistling about his ears, and striking up the dust of the plain before him, soon made him change his pace, and he rapidly disappeared. This time, when it was of little moment, the gun went off at the first trial; after this we saw no more of them, and the party having reached the boat we slowly retired, burning with vexation. It was the first time in my life in which I had seen wounds (and, as it turned out, death) inflicted in open field, or in any kind of strife, and the sensations were as new to me as they were unpleasant. A burning feeling of mixed rage and grief, and a kind of animal craving for revenge, seemed to take possession of the heart, and a reluctance to leave the spot till some kind of amends had been obtained. A glance at the broken nature of the country, however, full of scrubs and gullies, shewed how impotent any pursuit would be; and Yule, who hastened off with the Doctor and the wounded man

* The caps were very excellent, strong ones, of Purdy's make, and were, in fact, too stout, for the springs of the lock of this rubbishing piece of Belgian goods were not strong enough to split the sides of the cap and drive it home upon the nipple, without more than one blow. Thence the catastrophe!

in the first boat, gave us positive orders not to remain behind, but to follow immediately.

It was not till we got on board that we thought of the canoe, or we might at least have gone and brought off that, as some slight punishment, and it might have drawn them from their lurking-holes to receive a greater. On getting on board, we had great difficulty in withdrawing the spear from the wounded man, and when we did so, we found that the point and barb had remained behind.* Bayley lingered

* The wood of the spear had penetrated 4½ inches. On the post mortem examination it was found that the spear had passed between the heads of two of the ribs and the spine, splintering the bone of both, and had passed all but an eighth of an inch through the left lobe of the lungs. Had it not struck the spine, it would have passed through the body. The point was found to be a piece of bone, 3½ inches long, about a quarter of an inch thick in the middle, and coming to a very sharp point at each end, and thus acutely spindle-shaped. This was fastened in a groove at the side of the spear, with its point a little projecting, the upper point, of course, serving as a barb. This barb had caught under the spine, so that when, under Dr. M'Clatchie's direction, I endeavoured to withdraw the spear, I was pulling the barb against the inner surface of the spine, until at last, the gum perhaps being loosened by the heat and moisture of the body, the fastenings gave way, and the spear came out, leaving the point remaining in the chest. I do not know whether this is one of the intended uses of the gum fastening of spear heads, so universal over all Australia; but if the gum really does dissolve or soften, in such cases, it renders the spears still more deadly weapons than they appear. The force with which the spear is thrown by the aid of a "womĕrah," or throwing-stick, is tremendous. It acts just like a finger, between two and three feet long, applied to the

till the third day, when he died. He was an excellent man: quiet and attentive to his duty, with a good character in every respect.

It appeared from the account of the cockswain of the boat, that, while we were on the hill, the natives came down about the boats unarmed; that they were treated kindly, without any dispute or apparent offence given them, except that they were prevented taking several things out of the boats, which they attempted to do; that they went away together, and were again returning to the boats with their spears, apparently to attack and plunder them, when our coming down the hill stopped them. Annoyance at being thus frustrated in their hopes of plunder was the only reason we could assign for this treacherous and cowardly attack upon us. Cowardly, as they waited till the last man's back was turned, and ran as soon as they had speared him. I have always joined in reprobating the causeless injuries sometimes inflicted by civilized, or quasi-civilized man, upon the wild tribes of savage life; and many atrocities have doubtless been committed in mere wantonness, and from brutality or indifference. I have always looked, too, with a favourable eye on what are called savages, and held a kind of precon-

end of the spear. Any one who in darting a little bit of stick applies his finger to the end of it, will see how it increases its force, and may calculate what leverage he would gain in throwing a spear, if he had a finger three feet long to apply to the end of it.

ceived sentimental affection for them, that I believe is not uncommon. I had been inclined to suppose that they were rarely the aggressors, and were always more sinned against than sinning. One such practical example as this, however, wrought a great change in my feelings on these points; and though far, I hope, from abetting cruelty, I could make great allowances for any one who, under such circumstances as I have detailed, took a larger revenge than the strict justice of the case demanded. I felt that the life of one of my own shipmates, whatever his rank might be, was far dearer to me than that of a wilderness of savages, and that to preserve his life or avenge his death I could willingly shoot a dozen of these black fellows; and I could read the same feelings in the eyes of those around me. Nor was this feeling very transient; for many days or weeks after, it would have been felt as a relief by all those who saw Bayley's fall, to have come into collision with any party of black fellows they could have been justified in firing on.

CHAPTER V.

TWO WRECKS ON THE BARRIER—APPEARANCE OF SCURVY —FALL IN WITH MERCHANTMEN AND SUPPLIES—BEAUTY OF CORAL REEFS—GRANDEUR OF SURF—NIGHT SCENE FROM THE WRECK OF THE MARTHA RIDGWAY—SIR C. HARDY'S ISLANDS AND CAPE GRENVILLE—RAINE'S ISLET —MURRAY ISLANDS—MOUNT ADOLPHUS—BOOBY ISLAND.

June 26 to *July* 12, 1843.—During this time we fell in with the wrecks of two large vessels, lying on the edge of the Barrier. These were the Ferguson and the Martha Ridgway; one wrecked in 1840, the other in 1841. The former had part of the 50th Regiment on board at the time of the disaster; but I believe all, or nearly all of the crews and passengers were saved by another vessel in company. The wrecks were lying high, and nearly dry, at low water, about 100 yards from the outer edge of the reef, and just within the breakers, which, having no power to lift them farther, were now at high water battering them to pieces. We also fell in with three vessels on their passage through Torres Strait, as we had now reached the part of the Barrier, a little south of the twelfth degree of latitude, where vessels generally effect their entrance within the reefs. We were very glad to fall in with two of these vessels, the Winscales and the John Renwick, as they had some sheep, some

Hobarton potatoes and some excellent ale, on board. Our crews had now been so long on salt provisions, that the scurvy was beginning to shew itself with rather alarming force. We had twelve on the sick list, one or two of whom could hardly stand. Dr. Muirhead, our surgeon, had never seen scurvy in the navy before—so completely have modern discoveries and improvements eradicated that naval scourge. It is very seldom, however, that any vessel, except perhaps a whaler, remains, as we had now, eight months without putting into any port, or touching at any point where fresh vegetables or animal food could be procured. There is, I should imagine, no coast in the world, of anything like the extent, so utterly destitute as that of Australia, of everything in the shape of fruits, vegetables, or any other edible, except limpets and oysters. In our boat cruises along the coast, there was powder and shot supplied to the men; and Captain Blackwood had bought a double-barrelled fowling-piece for each boat for the men's use; but I do not recollect more than a single instance where a meal sufficient for all hands had been procured in any boat, or could have been procured, except by giving up every other object in order to shoot small plovers on the beach. Another drawback was, that many of the tins of preserved meat, supplied by the Government for the use of the sick and the boats' crews, were found to be of bad quality, the contents being in a filthy putrid state. Some sheep and

potatoes were now purchased, though at rather a heavy price, and issued to all hands in lieu of salt provisions; and the change produced by this diet, even on the worst cases, in a few days was really marvellous.

I had hitherto been rather disappointed by the aspect of the coral reefs, so far as beauty was concerned; and though very wonderful, I had not seen in them much to admire.* One day, however, on the lee side of one of the outer reefs, near the wreck of the Ferguson, I had reason to change my opinion. In a small bight of the inner edge of this reef was a sheltered nook, where the extreme slope was well exposed, and where every coral was in full life and luxuriance. Smooth round masses of mæandrina and astræa were contrasted with delicate leaf-like and cup-shaped expansions of explanaria, and with an infinite variety of branching madreporæ and seriatoporæ, some with mere finger-shaped projections, others with large branching stems, and others again exhibiting an elegant assemblage of interlacing twigs, of the most delicate and exquisite workmanship. Their colours were unrivalled—vivid greens, contrasting with more sober browns and yellows, mingled with rich shades of purple, from pale pink to deep blue. Bright red, yellow, and peach-coloured nulliporæ clothed

* Mr. Darwin, in his 'Researches,' expresses somewhat of the same disappointment. (See his account of the Keeling Islands, p. 547.)

those masses that were dead, mingled with beautiful pearly flakes of eschara and retepora; the latter looking like lace-work in ivory. In among the branches of the corals, like birds among trees, floated many beautiful fish, radiant with metallic greens or crimsons, or fantastically banded with black and yellow stripes. Patches of clear white sand were seen here and there for the floor, with dark hollows and recesses, beneath overhanging masses and ledges. All these, seen through the clear crystal water, the ripple of which gave motion and quick play of light and shadow to the whole, formed a scene of the rarest beauty, and left nothing to be desired by the eye, either in elegance of form, or brilliancy and harmony of colouring.

This beautiful portion is, however, only to be seen on the extreme verge and outer slope of a coral reef, when circumstances are favourable for its examination, which is not often the case.

The flat surface of the reef is a dull affair enough, though many elegant corals may be seen in the detached pools, or in the parts which are permanently covered by water.

I spent a long time at low water, wading about on the higher pinnacles of the coral and collecting specimens. These, however, when dry, lose half their beauty, from losing all their colour, which seems to belong wholly to the animal matter. Madrepore branches, the living tips of which were of rich blue, gradually faded towards the dead base into the yellow-

ish white of the corals in our museums at home. Unfortunately, the finest and most beautiful specimens require so much space, both to dry them at first and to pack them in afterwards, that their transport is difficult, and in a small man-of-war impossible. The smell of the animal matter also, while the corals are drying, is most sickening.

I observed to-day, that some considerable portions of coral, all alive and coloured, were left by the tide six or eight inches above the water, and remained so till it returned, or for nearly an hour. They did not seem injured by the exposure, which of course must frequently occur. I often observed the same fact, both before and since, and believe, that an exposure, of two or three hours, to the air and the sun will not kill many of the coral polyps, as long as they are left in the position of growth, and their cells thus retain the moisture. Perhaps some portion of the common body remaining under water may be essential; but I have seen blocks of living astræa, with the green animals in their cells, the top of which was eighteen inches above the water, and if I recollect rightly, the base also was dry.

During our next year's cruise, I spent a night on the wreck of the Martha Ridgway, when a party was sent to cut out some tanks for the use of Raine's Islet. I accompanied them, as I wished to take every opportunity of seeing the edge of the Barrier reef.

We had a heavy pull of a couple of hours, dead to

windward, from the ship's anchorage, before we reached the inside edge of the reefs, where we found the flood tide coming in over the reef like the rapids of a river. We passed, in a very short distance, from dark blue water to some coral blocks, on which we grounded. The men then got overboard, and we proceeded by dragging the boat over the coral in the deepest channels we could find, the men at one time standing only ankle-deep, at the next unable to touch bottom, and holding on by the gunwale till they could lay hold of the next lump of coral. This coral was nearly all alive over the whole surface of the reef, which had no sand bank or dry space upon it even at low water. Before we reached the wreck, we met a heavy ripple proceeding from the surf of the outer edge, often a couple of feet deep, and requiring some care to prevent the boat being staved as it fell in the hollow of the wave at the back of the ripple line. On getting alongside the wreck, we found a rather heavy surf breaking against her bow, and reached the deck with some difficulty by means of an old back-stay that had been part of her main rigging. She lay with her bow to the sea on her starboard bilge. She was still pretty perfect above, her deck, forecastle, and poop, and even the bulkheads of the cabins remaining. The foremast also was standing, but the tide flowed in and out of her below. Her lower deck, however, was dry, and at low water there was not above a foot or two of water in her hold. Mr. Moore, the carpenter, and Mr.

Weeks, the boatswain, with their assistants, immediately commenced operations for cutting through the decks, in order to get out the two five tun tanks, which, from their size, could not be got up the hatchways. Mr. M'Gillivray and I found our purpose of exploring and collecting on the reef frustrated by the depth of water. The reef was about a quarter of a mile wide, and ran nearly due N. and S. for several miles. It appeared indeed to stretch to the horizon in both directions, the breaks in its continuity being so narrow as to be barely perceptible. A fresh breeze was blowing from the S.E., and rather a heavy sea running outside. The water was perfectly clear, and of great and almost unfathomable depth right up to the outer slope or submarine wall of the reef. The long ocean swell being suddenly impeded by this barrier, lifted itself in one great continuous ridge of deep blue water, which, curling over, fell on the edge of the reef in an unbroken cataract of dazzling white foam. Each line of breaker was often one or two miles in length, with not a perceptible gap in its continuity. After recovering from this leap, and spreading for some distance in a broad sheet of foam, the wave gradually swelled again into another furious breaker of almost equal height and extent with the first, and then into a third, which, although much less considerable, yet thundered against the bows of the wreck with a strength that often made her every timber quiver. Even then the force of the swell

was not wholly expended, two or three heavy lines of ripple continually traversing the reef, and breaking here and there against the knobs and blocks of coral, that rose higher than usual. There was a simple grandeur and display of power and beauty in this scene, as viewed from the forecastle of the wreck (about thirty feet above the water), that rose even to sublimity. The unbroken roar of the surf, with its regular pulsation of thunder, as each succeeding swell first fell on the outer edge of the reef, was almost deafening, yet so deep-toned as not to interfere with the slightest nearer and sharper sound, or oblige us to raise our voices in the least. Both the sound and the sight were such as to impress the mind of the spectator with the consciousness of standing in the presence of an overwhelming majesty and power, while his senses were delighted by the contrast of beautiful colours afforded by the deep blue of the ocean, the dazzling white of the surf, and the bright green of the shoal water on the reef.

The reef, when closely examined, appeared to consist of a sandy floor, on which were thickly-clustered clumps of coral, scattered closely but irregularly about it. The corals appeared principally rounded masses of astræa and mæandrina, covered with their green-coloured animals in a state of expansion; there were, however, many finger-shaped madrepores of beautiful purple colours, and leaf-like expansions of explanaria and other branching corals.

These were now generally covered with from one to four feet of water, but some masses were level with its surface. The whole was chequered with spaces of white sand, had a bright grass-green hue when viewed from a distance, and when looking down on it from the poop of the wreck, might have been likened to a great submarine cabbage garden.

Before it got dark we had righted the old coppers of the ship, which were lying on the deck, in order to cook the men's suppers, and after a little trouble we rigged a kind of table in the cuddy with some of the bulk-heads, and established ourselves for the night. We found written on one of the bulk-heads the following notice :—

"Boarded by us 27th Sept. 1842; found the vessel gutted of all portable articles of any value; found New Zealand newspaper of 14th June, and a writing on the forecastle importing the ship went ashore July, 1842.

Norman Miller . Comr. of Wilmot, Greenock.
Michael Wycherly ,, Platina, London.
John C. Ward . ,, Brig Charlotte, Sydney."

As I was walking the poop of the wreck before looking out for a "soft plank" to sleep on, I could not help being struck with the wildness and singular nature of the scene. A bright fire was blazing cheerfully in the galley forward, lighting up the spectral-looking foremast with its bleached and broken rigging, and the fragments of spars lying about it. A few of our men were crouched in their flannel jackets

under the weather-bulwarks, as a protection from the spray which every now and then flew over us. The wind was blowing strongly, drifting a few dark clouds occasionally over the star-lit sky, and howling round the wreck with a shrill tone that made itself heard above the dull continuous roar of the surf. Just ahead of us was the broad white band of foam which stretched away on either hand into the dark horizon. Now and then some higher wave than usual would burst against the bows of the wreck, shaking all her timbers, sending a spout of spray over the forecastle, and travelling along her sides would lash the rudder backwards and forwards with a slow creaking groan, as if the old ship complained of the protracted agony she endured.

She had been wrecked since we had ourselves left home, and entered the southern hemisphere, and there mingled perhaps some speculations as to our chance of leaving the old Fly in some similar situation with the highly-wrought feelings which the mere character and aspect of the scene sufficed to impress upon the mind. The place was so far removed from the regions of civilized life, and so far even from any dry land at all; the reef, also, on which we stood, was one of nature's mysteries, its origin equally wonderful and obscure, its extent so vast, and its accompaniments so simple, so grand, and appropriate;—altogether, I shall not easily forget my night-walk on the weather-beaten poop of the wreck of the Martha Ridgway.

July 12.—Sir Charles Hardy's Islands are three small rocky islands, covered principally with coarse grass; a few small trees, or bushes only, growing in the more sheltered corners.

The southern one is very small; the two others larger: the northern one rising at its highest point, about 280 feet above the level of the sea. The rock was siliceous, hard, and brittle, of a brown colour; it sometimes put on the appearance of flinty slate, at others it seemed to be passing into porphyry, containing here and there crystals of red feldspar. I could not make out any satisfactory lines of stratification, nor were any other of its divisional planes regular or persistent. Small fringing coral reefs surrounded the islands, on which I got a better harvest of shells and mollusca than I had hitherto been able to procure. Calcareous sandstone, with corals and shells, was found here and there above the reach of high water, with pandanus trees growing upon it, but not sensibly differing in structure or appearance from the mass of the reef that was covered at high water.

July 14 to 18.—I accompanied Mr. Aird in the "Midge" to Cape Grenville, from the summit of which a set of angles was wanted. We anchored among Sir Everard Home's Group, and the next day landed with a party of six men, all being well armed, but did not see a single native, nor any trace of one. From the top of the hill over the Cape, which was about 400 feet high, we looked

over a barren and desolate country, very sandy, and having low ranges of hills, covered with short scrubby woods. The rocks of Cape Grenville were the same as those of Sir C. Hardy's Islands. Altogether the excursion was a most uninteresting one, with nothing to repay the discomfort of a two days' beat back to the ship, in an open boat, against a strong breeze, and a short tumbling sea. Sir C. Hardy's Islands were a frequent resort with us the following year, while the beacon was being built on Raine's Islet, and we formed dams to catch the rain water at the mouths of the two principal valleys of the middle island, from which we procured a tolerable supply of that necessary article. During our first cruise we landed a sow and a boar, which, on our return, had produced a fine litter of young pigs, but I am afraid they were all shot at that time. The place, however, was well adapted to them, as the pork was excellent.

July 29, 1843.—I landed with Captain Blackwood and a party on Raine's Islet, where we spent the afternoon and night. Raine's Islet is about 1000 yards long, by 500 wide, and in no part rises more than 20 feet above high-water mark. It is formed of a plateau of calcareous sandstone, which has a little cliff all round, four or five feet high, outside of which is a belt of loose sand, forming a low ridge between it and the sea. Some mounds of loose sand also rest upon the stone, especially at its western end. The length of the island runs

To face page 126.

RAINE'S ISLET.

in about a N.N.W. and S.S.E. direction. It is surrounded by a coral reef, that is narrow on the lee side, but to windward, or towards the east, stretches out for nearly two miles. The surface of this reef is nearly all dry at low water, and its sides slope rapidly down to a depth of 150 or 200 fathoms. The island is covered with a low scrubby vegetation, partly of reed-like or umbelliferous plants, and partly with a close green carpet of a plant with succulent leaves and stem, which we subsequently found was good to eat, and so went with us by the name of "spinach." The central part of the island had a rich black soil several inches deep, and here we commenced to dig a well, having brought pickaxe and spade, to try if we could find water. We dug about five feet deep, but found the rock too hard and tough to allow us to proceed further. The following was the section :—

	ft.	in.
Good black vegetable mould	0	6
Stone, brown mottled with white, hard and coarse-grained	0	3
Rich moist black soil, like bog-earth . .	1	4
Stone of a light brown colour, rather soft, but tough, and yielding slowly to the pickaxe .	3	0
	5	1

The stone was made up of small round grains, some of them apparently rolled bits of coral and shell, but many of them evidently concretionary, having concentric coats. It was not unlike some

varieties of oolite in texture and appearance. It contained larger fragments of corals and shells, and some pebbles of pumice, and it yielded occasionally a fine sand that was not calcareous, and which was probably derived from the pumice. Some parts of it made a very fair building stone, but it got softer below, till it passed downwards into a coarser coral sand, unconsolidated and falling to pieces on being touched. In the quarries that were opened next year for the beacon, many recent shells, more or less perfect, were found compacted in the stone, and one or two nests of turtle eggs were discovered, of which, in some cases, only the internal cast had been preserved, but in others the shell remained in the form of white carb. lime. Some drusy cavities also were found in the stone, containing crystals of gypsum, or sulphate of lime. The presence of this mineral seems very odd, as I do not see whence the sulphuric acid could proceed. It is evident from the fossil turtle eggs, that the consolidation of the stone had taken place after it was raised above the sea. It was due, probably, to the infiltration of the rain water percolating through the calcareous sand, that had been gradually piled above high water mark by the combined action of the winds and waves. The thickness of the vegetable soil in its centre shews that it has been above water for a great length of time.

The whole surface of the island was covered with old and young birds. These consisted of frigate-

birds, boobies, gannets (a new species), noddies, and black and white terns (likewise new), the only land birds being land-rails. The frigate-birds had a small colony by themselves; their nests consisted of a platform about a foot high, on each of which was one young bird. There were young of all ages, some able to fly, others just hatched, and covered with yellowish white down. Those which could not fly assumed a fierce aspect as we approached, and snapped their beaks at us. The boobies and gannets each formed separate flocks, but few of them had either eggs or young ones. All the rest of the island was covered with the eggs and young ones of the terns and noddies. The terns' eggs lay scattered about the ground without any nest, and how each bird found its own again among so many was a marvel to us. The young terns were also of all ages, some fluttering up into the air from under our feet, others just hatched. Each one seemed unalterably attached to the spot where it had been hatched, and immediately returned to it on being driven off. We had picked a clean spot on the sand, just on the top of the beach, for our bivouac; but there was one young tern there, a few days old, that we could not keep away from among our things, and the old one kept hovering and sailing and screaming, just above our heads, to look after it. The whole island stank like a foul hen-roost, and we were covered with bird-lice and ticks after sleeping in the sand. We dined upon young boobies

and frigate-birds and terns' eggs—the latter were excellent, and the former very good, especially when cooked with a little curry powder.

As night closed in, it was curious to see the long lines and flocks of birds streaming from all quarters of the horizon towards the island. The noise was incessant and most tiresome. On walking rapidly into the centre of the island, countless myriads of birds rose shrieking on every side, so that the clangour was absolutely deafening, like the roar of some great cataract. There were a few turtle tracks on the beach, but we did not succeed in taking any, though many dead ones were scattered about the island, their shells and skeletons remaining. Some of these were lying on their backs, and we at first thought had been turned and left there by some casual visitors. Those in this position, however, were all near the foot of the little cliff behind the beach, and I found one tilted up against it, resting between it and a fallen block, and am inclined to suppose that when feeble, from sickness or age, the turtle have come here to die, and that those lying on their backs had died in a vain attempt to crawl up the broken bank into the interior of the island. We could see no traces of natives, nor indeed of any one else having visited the island. It is too far out of sight of any other land, and too much out to sea for the natives to visit it; nor is it likely that ships would often heave to, to send a boat ashore where there is no anchorage, and where the smooth water

inside the reefs is not yet attained. The Fly was obliged to anchor about twelve miles off in the S.W. inside the line of the Barrier.

August 1.—We anchored in the Pandora entrance, where H.M.S. Pandora was lost in 1791, on her return from Tahiti, with part of the mutineers of the Bounty. There is a large sand bank here, on which the crew of that vessel were saved. Many dead turtle were found here also lying on their bellies, so that it appears they come up on these banks to die on the land.

August 3, 4, 5, 1843.—During this time we were running down to the north, outside the reefs, and not being able to find any opening were obliged to stand out to sea every afternoon and beat to windward, in order to get a sufficiently large and clear space in which to spend the night. The S.E. trade wind was blowing very strongly, with a heavy sea running, so that, with a known danger on one side, and many unknown but very probable ones on the other, we passed but an anxious time of it. The opening by which we at last got inside on the morning of the 5th, was by no means an inviting one, since it was encumbered by small patches, the ends of which overlapping, seemed almost completely to block the passage with a continuous line of foam. On getting among them, we found the patches small, and by winding through them, we soon passed into smooth water and good anchoring ground, and

ran down to Murray Island, where we came to anchor at 3 P. M.

August 6. – Murray Island is about 700 feet high at its highest point, and consists of steep broken ground. Its whole aspect is singularly different from any part of Australia, since the whole of its lower portion, and a good part even of the hills, is covered by a continuous grove of cocoa-nut trees. The entire absence of these trees from every part of Australia is a most striking fact, since it is, I believe, the only country in the world so much of which lies within the tropics in which they have never been found. We had once or twice found cocoa-nuts on the beach, still more or less fresh; and here is an island, absolutely within the Great Barrier reef, completely covered by them, and yet neither by Flinders, King, Wickham, Stokes, or ourselves, have any trees been discovered anywhere upon the main land. We could perceive many natives on the beach of Murray Island, as also a nearly continuous line of large dome-shaped huts, surrounded by fences of tall poles ornamented by large shells; everything shewing the natives to be a different race of beings from the Australians. The numbers of these people, and the character for treachery and ferocity they have hitherto borne, rendered us cautious how we put ourselves in their power; accordingly, Captain Blackwood ordered two boats to be got ready, in one of which was a guard of

MURRAY ISLANDERS EAGER FOR BARTER.

marines; while Mr. Melville the artist, and myself, accompanied him in the other.* The island is surrounded by a reef, which was now getting dry with the falling tide, and as soon as we got upon its edge, we were surrounded by about one hundred of the people, among whom were some women and children. They were all shouting and jabbering, holding up plates of tortoiseshell, bows and arrows, and cocoa-nuts, for barter, and clamorous for "toorree" (iron) and knives. For the latter they used the word "knipa," evidently got from passing vessels. We got a few cocoa-nuts and a very powerful bow, made of bamboo, six feet long, with a thin band of bamboo for the string, and a bundle of arrows, each four feet long, made of a reed, with a hard-wood piece inserted for the point. The men were tall, well made, stout and muscular, with fuller and more powerful limbs than the Australians. Their colour was a dark brown, approaching to black, the hair frizzled, but often dressed in short, close, pipe-like ringlets, something like a thrum mop, and looking frequently like wigs;† none of them had lost a front tooth, neither were they cicatrized or tatooed, except a faint oval scar on the shoulder. The men were naked, but the

* In our subsequent voyage, we found these precautions superfluous, and established very friendly relations with these people.

† We afterwards found, to our great astonishment, that some of these really were wigs, and excellently made.

women had a short petticoat of leaves, reaching from the waist to the knee.

As they were so numerous, and we could not land without wading a long way over the reef and leaving the boats, we in a little time returned to the ship, hoping they would come off in some of the canoes we saw lying on the beach. One man volunteered to go off with us, but after going a little way his heart appeared to fail him, and diving overboard, he swam back to his companions. In the afternoon, we were watching with our glasses from the ship a party of natives sitting in a circle on the beach, and another party outside playing with their children, apparently teaching them to use the bow and arrow, and running races on the sand. Their canoes appeared to be similar to those we had seen at Cape Direction, but it was blowing too strongly for them to venture off.

August 7.—The wind was so very fresh and the sea so rough, that no communication took place with the shore to-day, and the next day we beat up to the eastward of Murray Island, and then continued the survey to the York Islands. On August 11, we anchored in Blackwood Bay, under Mount Adolphus. On the 15th, the Bramble and Midge rejoined us here, and our surveying operations were closed for the season, the Midge being unrigged and hoisted on board the Fly again. The York Islands were exceedingly barren and uninteresting. There were but few birds, and those small. The rocks are

all porphyry, varying from a softish base, apparently feldspathic, with small transparent quartz crystals, to a hard siliceous base, with flesh-coloured crystals of feldspar. I climbed Mount Adolphus, which is nearly 500 feet high, but got only a partial view, owing to the thick stunted wood that clothes its sides and spreads over the flat plateau of it summit.

August 14.—After passing the narrow and dangerous passage north of Wednesday Island, we hove to off Booby Island, a small rocky islet, about fifty feet high and a third of a mile in diameter. It forms the western limit of all the dangerous part of Torres Strait that lies in the ordinary track of vessels, and it is usual, accordingly, for ships passing through to call and leave a notification of the fact. For this purpose a small shed had been erected, under which was a box containing a blank book, with pens and ink, and a bag of beef and some biscuit, for any boat's crew escaping from a wreck. We were rather amused by some of the notices and messages left in this book, especially by one or two from the fairer half of creation. One lady left her kind love to any other lady that might hereafter pass this way, and she would be most happy to see her at her father's house, such a number, such a street, Bow Road, London. Another lady begged her *kind* REMEMBRANCE to *any* other lady passing through.

CHAPTER VI.

CAPE YORK—NATIVE TOMBS—EVANS' BAY—HUT AND BUNDLE OF BONES—MEETING WITH NATIVES—THEIR CHARACTERS—ANOTHER PARTY OF A DIFFERENT TRIBE—COMATULÆ—METHOD OF PRESERVING ECHINODERMATA—HABITS OF LINGULA—POSSESSION ISLANDS—MEGAPODIUS MOUNDS—PORT LIHOU—THE N.W. MONSOON—ISLANDS OF TORRES STRAIT—GEOLOGICAL STRUCTURE—TURTLE-BACKED ISLAND—MIGRATION OF BIRDS.

In the year 1844 we again ran from Sydney, along the North-east coast up to Raine's Islet, and built a beacon on it.* During the latter part of the time occupied in building this, the Bramble was detached to make a complete survey of Endeavour Strait. Mr. Macgillivray (Lord Derby's naturalist), Mr. Melville our artist, and myself, tired of remaining in inaction near Raine's Islet, got permission to accompany her, and were kindly and hospitably entertained by Lieut. Yule and his officers, for more than a month on board of her.

August 20, 1844.—We landed on Cape York Island, a small rocky hill, not quite 300 feet high, steep and nearly conical, separated from the land by a narrow boat passage merely. On its northern

* An account of this beacon will be found in the abstract of the voyage in the appendix.

side, about fifty feet from the sea, we found a native grave, on the brow of a small precipice. It consisted of a pile of skulls and bones, chiefly of turtle, but with a few that had belonged to a dugong. Most of the bones were very old, but some of those of the turtle were almost fresh, the shell still adhering to them. The pile was six feet long, four feet wide, and three feet high. It was surrounded by slabs of stone, and from the centre of it protruded a piece of bamboo about five feet long. Similar

graves were found at one or two other points on this island, and one on a little bushy islet some miles to the eastward. This one, however, was in a peculiarly picturesque and appropriate situation, a bleak and desolate spot, overhanging the sea, and well adapted for solemn and mournful reflections.

Mr. Macgillivray afterwards examined the inside of the pile, and found human bones belonging to more than one individual, but no complete skeleton, nor even an entire skull.

Immediately south of Cape York Island the land rises into a pretty-sharply-peaked hill, called Bremer Peak, which is 420 feet high. Immediately to the eastward of this is a shallow recess or bay, with a small rocky patch above water in the centre of it, about a mile from the shore. The bay is surrounded by a flat sandy beach, at the back of which is a belt of jungle composed of many kinds of broad-leaved trees, and one or two species of palm. Behind this

is a small woodland, of the usual gum forest of the country, the trees scattered, and the ground covered with long grass. Some rocky hills, about 300 feet in height, rise a little distance from the shore, one ridge of which comes almost down to the beach, but other portions fall back, leaving pleasant grassy flats between them and the sea. Everywhere, at the back of the beach, excellent fresh water was procured by making a hole in the ground. This is especially the case at the eastern end of the beach, a quarter of a mile behind which are some fresh-water pools draining into a small mangrove swamp. This mangrove swamp continues all along the next small bay to the eastward, which is shoal and muddy. In the fresh-water pools were some fresh-water fish of full growth, proving their constant character. From the sandy beach, the water deepens out to sea very gradually, so that vessels are obliged to anchor about a mile from the shore; the sea, however, is always smooth, and there is no surf on the beach, except in the rare occurrence of a gale from the northward. We visited this bay, which received the name of Evans's Bay from the master of the Fly, in the months of August, September, February, and June, during the years 1844 and 1845, and were never without pleasant and refreshing showers, and a fine fresh sea breeze during the day, and frequently throughout the night. At our first visit the natives avoided us, though from lights being seen moving ashore during the night, they were evidently present.

On February 14th, 1845, as we stood in for the anchorage in our return from Java, the wind being very light, the Midge was sent a-head, with orders to moor her little boat at the edge of the four fathom line of sounding as a buoy, to guide us to the anchorage. As we rounded Cape York Island, we saw a canoe with four natives alongside of this little boat, rifling her of her contents; and after getting up her anchor, they put two men into her and paddled both canoe and dinghy to the shore. As we were moving very slowly through the water, and they were at least a mile off, we had no chance of intercepting them but by a shot. One accordingly was fired from one of our long guns, which, falling in the water somewhat near them, caused the two natives to spring into the water out of our boat and make for their own, in which they got ashore and dispersed. A small hut then occupied the centre of the beach, made of a low tunnel-shaped frame of sticks, 15 feet long, 4 feet wide, and about 3 feet high in the middle, covered with sheets of bark. Inside were some bundles of bark, containing the bones of a human body, with the flesh still adhering to the extremities. These were at first only cursorily examined and left; and at our next visit to the shore all had been removed. The custom of carrying the body of deceased relations till the flesh drops off and they become dry and clean, appears to prevail here also as well as in other parts of Australia. It is probable that, in this neighbourhood, the bones are subsequently

NATIVES AT CAPE YORK.

deposited on the ground, and covered with a cairn of turtles and dugong's bones or other material.

For two days after the above occurrence, the watering party ashore saw no signs of natives, when suddenly one morning a party of sixteen or twenty were observed coming along the beach from the direction of Mount Bremer. As I happened to be present, I will describe the first interview, both as illustrating their manners, and as a guide for any one who, being a stranger to the people, may be placed in similar circumstances. The principal part of the watering party were gone aboard to breakfast, leaving only Lieut. Risk and Mr. Harvey, with two marines at the tent, and Lieut. Yule and myself, who had gone ashore to bathe. The natives advanced in a rapid and tumultuary manner, as if with hostile intentions, and we consequently each took a musket and went to meet them. Arrived within about 200 yards of us, they halted, and on our approaching nearer, made signs of disapprobation, and retired to the edge of the jungle. I accordingly advanced alone, telling Risk and Yule, I would throw myself down on the ground, if I saw occasion, when they were to fire over me. On getting within about fifty yards of them, I laid down my musket and advanced with extended arms.*

* On such an occasion as this, a pair of small pistols concealed about the person, while it does not diminish the confidence of the natives in his good intentions, adds materially to the confidence of the person who is making the experiment on their's.

Seeing several with spears, I halted, and signed that they should throw them away, which they immediately complied with, and on my coming up to them, four stepped forward and embraced me, laughing, dancing, and yelling. Yule and Harvey then gradually came up, and brought me my musket, and also some biscuit and presents for the natives, and we were immediately excellent friends. We then drew a mark on the sand, and signed to them that they were not to come within that towards the tent: this they immediately understood and complied with.

They remained about us during our stay, but never gave us any trouble. While shooting alone at the back of the bay, I one day fell in with six or eight of them, who did not offer me the least molestation.

The Prince George, a small cutter of eighty tons, then one of our tenders, watered here afterwards, and though the natives were superior to them in number they gave no trouble, but on the contrary, assisted in rolling off the water-casks, and in other ways.

These people, however, were not the permanent inhabitants of the place, but belonged, I think, to the islands on the north side of Endeavour Strait. Mr. Millery, then clerk of the Fly, devoted himself particularly to collecting a vocabulary of the language of the people of Torres Strait, and collected about fifty of the words of this party. These people were sufficiently ugly, and in person, not very different from the Australians. Their hair, however, was frizzly or "tufted," which the hair of the true

Australian never is. They wore wigs, which we never observed among the Australians, and were also but little scarred.

In the beginning of June 1845, we found another party of natives in this bay, quietly occupying it as if they were at home. They were only five in number, and different in aspect and character from the former party. These five men had a more lanky build than the others, their hair was diffused and curly, and they precisely resembled the people of other parts of the continent. Out of fifteen words which I collected from them, eight or nine were different from the words got for the same objects from the former party.

On the beach of Cape York, I found a few small shells of the genus oliva, being the first time I had met with that genus alive; and also an abundance of comatulæ. These latter animals, so interesting to the geologist, on account of their affinity to the encrinite, were of three or four species. The largest were of a dark wine colour, almost black, and were sometimes so large as nearly to fill the inside of a man's hat. At low water they were found in great numbers on the shallow sandy flats in a few inches of water, and were then mostly in a contracted state, with their arms curved inwards like a ball. Their movement of the arms was sufficiently rapid and energetic, but they seemed to trust principally to the current of the water for their motion from place to place.

I had much difficulty in drying and preserving those I had hitherto collected, as the slightest touch, or even their own struggles, were sufficient to detach their limbs soon after they were taken out of the water. I succeeded now by taking with me a bucket of fresh water and a number of pieces of cotton cloth, in one of which I immediately wrapped each specimen loosely on taking it up, and then plunged it in fresh water. On getting on board, after they had been soaked for two or three hours, they were taken out and suffered to drain till nearly dry, then re-soaked for a short time, and afterwards had poured over them a saturated solution of corrosive sublimate in camphorated spirits of wine. They then easily dried, and remained pretty firm afterwards. A similar plan should be adopted with ophiura, euryalus, delicate asterias, and almost all the echinodermata. I procured also from a muddy bay, to the east of Evans' Bay, a number of the genus lingula, alive. The shells lay buried in a close unctuous mud, two or three inches deep. They were always in a vertical position, with the beak downwards. The fleshy or gelatinous pedicle which passed from between the beaks was five or six times as long as the shell, and passed down into the mud, ending in a thickened knob. These pedicles did not appear to be attached to anything. On pulling at the shell a slight resistance was felt, but not more than would be caused by the knob being drawn through the narrower hole in which the pedicle lies.

I have been rather particular in describing the little bay east of Mount Bremer, because it seems to me very well adapted for the station of a small post which, ere long, must, I think, be established in this neighbourhood. To the advantages of abundant wood and water, safe anchorage, an agreeably undulated and sufficiently elevated surface, whether for healthy residence, or the establishment of signal posts and look-out stations, it adds that of having a strip of very fertile soil immediately behind the beach, now occupied by a jungle, but well adapted for a garden, and two or three grassy plains on one side of it, surrounded by steep little rocky hills, and admirably adapted for horse and cattle paddocks. To the west of Mount Bremer, between it and Endeavour Strait, there are also some small plains between the hills and the sea. These lie between Mount Bremer and Peaked Hill, which is 540 feet high, and are five or six miles long, by one or two in breadth. Tall green grass covered these plains in the month of June, the driest season of the year, and water was to be had in the gullies. There is, therefore, abundant means for the support of a small party, similar to that which has been for some years posted at Port Essington. I shall, however, return to this subject, and therefore dismiss it for the present.

The Possession Islands, in the mouth of Endeavour Strait, and the larger islands to the northward, are all rocky and barren, with here and there small

fertile and cultivatable spots. They are by no means deficient in beauty, being of varied and undulating surface, with lofty peaks and ridges, and sheltered valleys, but they seem to be mostly destitute of water, except in the rainy season; and their inhabitants are few and scattered. We had one or two interviews with them while surveying Endeavour Strait in the Bramble, and they were always peaceable and well disposed, and appeared to have communicated with Europeans before.

On one of the smallest of the Possession Islands Mr. Macgillivray shot a brace of those curious birds, the Megapodius tumulus of Gould, and we examined one or two of their mounds. One of them we opened, and are thus able to corroborate the singular account given by Mr. Gilbert,* in Gould's Birds of Australia.

There were two large mounds just inside a narrow belt of mangroves, at the back of the beach. The largest was apparently an old one. Its figure was an irregular truncated cone on an oblong base, which measured 150 feet in circumference. The slope of its sides measured from eighteen to twenty-four feet, its perpendicular height being ten or twelve feet. On the top was a slight hollow, and it rested on

* I cannot mention the name of this gentleman without saying how much I, in common with all who knew him, regretted his unfortunate death. About this time (August, 1844) he set out with Dr. Leichardt from Sydney, and was killed by the natives on the borders of the Gulf of Carpentaria.

rather uneven ground. It seemed to be composed of earth and fragments of coral, of which large quantities were lying on the beach on one side of it. Its lower portions spread over the roots of several old trees, which were now growing through it. Near the top of the hill, 200 or 300 yards from the beach, and 60 or 80 feet above it, was another mound, smaller, but apparently newer and more perfect. This was a pretty regular cone, on a circular base, the circumference of which was seventy-seven feet. It was about eight feet high, the slope of its side measuring about fourteen. The top was flattened, and about three feet in diameter. This had likewise begun to encroach on one or two neighbouring trees, of which it had buried the stem to the height of one or two feet. Externally, it seemed to be composed of loose earth and fragments of stone, mixed with pieces of stick. Many of the stones were as large as the first. We began digging into it about two-thirds of the way up on one side, but found the interior so firmly compacted together with sticks and stones and roots of trees, that it was no easy task, and after working for two or three hours, were obliged to get two men to assist us. With their help, we at last cleared off three or four feet of earth and got into the interior, where we dug down, and presently came upon a broken egg. This was an old one, the yolk being partly consolidated and rotten. We then turned up several spots full of fragments of egg-shells, and then

another half-egg, which contained several fragments of bones, the young one having died before it was quite hatched. We then took to our hands, and by groping into a soft spot, we succeeded in finding a perfect egg. This, however, was addled. This egg is very large for the size of the bird. Its length was $3\frac{1}{4}$ inches, its width, in the centre, $2\frac{1}{8}$ inches; its circumference, lengthwise, was $8\frac{1}{2}$ inches, and across, $6\frac{3}{4}$ inches. Its form was squarish, its colour white, covered with a thin, brittle, cream-coloured epidermis. It was firmly bedded in the earth, which just around it was devoid of sticks or stones. We could perceive no additional temperature in the centre of the mound, the soil feeling cooler to the hand than that on the surface in the shade of the trees.*

These megapodius mounds were very abundant in the islands about Endeavour Strait and round Cape York, as well as on the neighbouring mainland. They did not appear, however, to extend to the islands of the centre of Torres Strait, but they are abundant at Port Essington, and occur down the North-east coast as far, I believe, as Cape Hillsborough, in lat. 21°.

During the survey of Endeavour Strait, we landed at what is called in the Admiralty Chart, Port Lihou, in search of water, which was said in the chart to occur there. Captain Lihou examined it

* The reader who wishes for further information on the singular habits of these birds, is referred to the plate and description in one of the numbers of Gould's splendid work on the birds of Australia.

during the N.W. monsoon, when water is everywhere abundant, and with the wind to the N.W., it would be no doubt a sufficiently good anchorage. It is, however, but a shallow bight encumbered by rocks and shoals, with no shelter from the S.E. trade wind nearer than the main land opposite, and we failed to discover any water; though in the May of the following year, the Midge procured there sufficient for her wants. Near the beach, in the centre of the bight, we found a singular native tomb, apparently quite recent.

Round a central mound of sand, there had been a broad ditch or hollow scooped out, and swept quite clean for several yards in width. The mound was of a quadrangular form, eight feet long, four feet wide, and three feet high. A stout post stood

upright at each corner, and the sides were ornamented by rows of the ribs of the dugong placed regularly along them. Between the two posts, near the sea, a long stick had been inserted, ornamented with feathers and streamers of grass, and fastened to the post by other cross sticks similarly ornamented. On each post was either a large shell or the skull of a dugong, and on the grave were several other dugongs' skulls, and shells of the nautilus pompilius. All these, as well as the posts, were smeared with red ochre. We were careful not to disturb or leave any other trace of our presence than our foot-prints in the sand around, which it would have given us too much trouble to erase.

The whole of Endeavour Strait seemed perfectly safe for shipping, except in one or two places near the shore. The only coral reefs were a few small fringing reefs close to the islands, which are generally bold and rocky. The tides are very strong, and the western entrance of the Strait is encumbered by very large sand-banks, through which, however, there is now a safe and direct passage surveyed, with never less than four fathoms water at the lowest spring tides.

In February, 1845, we entered from the westward, and got very safe anchorage under Bramble Island, while the wind was blowing strongly from the westward. We lay there two days, during which I accompanied Captain Blackwood and Lieut. Ince on a boat excursion up an unexplored

channel to the northward. It led out into "Wolf Bay" of the Admiralty chart, and divided the land thereabouts into several small islands, the channels between which were often a mile in breadth, with four fathoms water. Shoal parts were seen here and there; but for small vessels there was abundance of the most sheltered and land-locked harbourage. Water also was abundant during the N.W. monsoon; but in the dry season of the year would probably be deficient. We fell in with a large party of natives, whose canoes were the finest and largest we had yet seen, precisely resembling those we afterwards saw among the islands to the north-east. The natives were perfectly friendly; and during our absence, another party visited the ship with tortoise-shell and other things, which they offered in barter, and conducted themselves in the most peaceable manner.

From February to June 1845, we were engaged in surveying the northern and eastern parts of Torres Strait. We had come from Java with the N.W. monsoon, which commenced there in November or December. In Torres Strait we found the weather variable. The S.E. trade wind would sometimes blow for several days together, succeeded by a wind from the N.W. With both winds we had much fair weather, and both varied in strength from a light air to a stiff breeze. We had, however, two heavy breezes, amounting to gales, from the N.W., with very heavy rain, and thunder and lightning. They

lasted in each case several days. The heaviest gale was in the beginning of March, and it was succeeded by fair weather, and light north-westerly winds, which on the 20th of that month* drew round to the east and south-east, from which quarter they continued to blow during the rest of our stay. The S.E. trade blows lightly at first, during the month of April, and increases in general strength till June, during which month and July it often blows very strongly, and then gradually fails again in September, into a gentle breeze. At what time the N.W. monsoon begins in Torres Strait is as yet unknown, but probably from the end of October to the middle of March, the weather is uncertain and the winds variable, shifting from S.E. to N.W. with much pleasant weather, but with occasional tempests from the latter quarter.

A detailed account of all the small islands scattered through Torres Strait, would be too tedious; I shall therefore sketch out merely their principal features, and then proceed to those which are the most interesting, namely, those in the neighbourhood of Erroob or Darnley Island.

If we take Endeavour Strait, Cape York, and Mount Adolphus, as a base, all the islands which stretch across the Strait to the northward of them have one common character. They are all steep

* Captain King, in his voyage, had the last of the N.W. monsoon on March 26th, between Cape Arnheim and Port Essington. —King's Voyages, vol. I. p. 61.

and rocky, and many of them as much as 500 or 600 feet in height. The rocks of the mainland and the islands immediately adjacent, are all porphyritic, like those described as composing Mount Adolphus. Porphyry, sienite,* and siliceous schists, or compact feldspar, compose all the other islands which I visited, or of which I was able to procure specimens. These islands are in fact merely the submarine prolongation of the great mountain chain of the eastern coast of Australia. This chain runs from Van Diemen's Land, through Bass's Strait into the colony of New South Wales, which it traverses throughout, at a mean distance of 70 or 80 miles from the sea. It extends along the whole of the North-east coast, where its loftiest and most massive portion is between Cape Upstart and Cape Melville. From that point its mean height gradually decreases to Cape York, where the hills are only 400 or 500 feet in height, and then sinking below the sea, its highest pinnacles only are seen, forming the islands of Torres Strait, from Cape York Island to Mount Cornwallis, on the coast of New Guinea.

In this central north and south band of Torres Strait there are no independent coral reefs. The coral only occurs in small fringes round the islands. The bottom is either mud or fine sand, and there is a remarkable uniformity of depth, which scarcely

* Cap Island has been erroneously supposed to be volcanic, it is a bare mass of sienite.

varies from ten fathoms by more than a fathom or two over the whole distance from the coast of Australia to that of New Guinea. The north-west portion of this band of islands has not yet been examined; but north of Banks's Islands and Mulgrave Islands there appears to be a large patch of true coral reefs in which the Hormuzeex and Chesterfield got entangled in 1798. The eastern limit of this central band, however, is very well defined by a line running a little east of north from Mount Adolphus, and just east of Harvey's Rock, Saddle Island, and Turtle-backed Island. To the east of this line there are no islands in which any such rock as porphyry or sienite occurs; but all are low coral islands, scarcely raised above the sea; and multitudes of true independent coral reefs of great extent are scattered about with considerable apparent irregularity. Having traversed these for sixty miles towards the east, we again come to a few high and rocky islands, namely, the three Murray Islands and Erroob or Darnley Island. These, however, are volcanic islands, consisting principally of lava. Another low island to the north of these, called Bramble Key, or Caedha, has likewise a patch of volcanic rock in its centre, and another not far from it.

Of the rocky islands occurring in the central north and south band of Torres Strait, some are inhabited and some not, or only occasionally so. All those permanently inhabited, and at a distance

of thirty or more miles from the Australian coast, have cocoa-nuts upon them. Captain Blackwood landed upon Mount Ernest (807 feet high), and found a group of huts much superior to any we ever saw in Australia, a small grove of cocoa-nuts, and another of large bamboos. The natives did not shew themselves till after he left the island; and though he spent a night on it, he did not suspect their presence at the time. In the huts were found parcels of human bones, ornamented with red ochre, a mask or hideous face made of wood and ornamented with the feathers of some struthious bird, and one or two bundles of small wooden tubes, eight inches long and half an inch in diameter, the use of which we never could discover. The feathers, so abundantly used as ornaments on their canoes and other articles by all these islanders, were at first taken by us for emu feathers, as a matter of course, and supposed to be procured from the main land of Australia. I was afterwards, however, induced to doubt the correctness of that supposition; and on comparing them (in company with my friend Mr. George Bennett of Sydney,*) with the feathers of the emu, in the Sydney Museum of Natural History, we found them to be totally distinct from any emu feathers. They are probably, therefore, feathers of the cassowary or some similar bird, and are derived from New Guinea instead of Australia.

On Turtle-backed Island we found a few small

* Author of "Wanderings in New South Wales."

groves of cocoa-nut trees near a group of huts, with a little thicket of bamboo; and near the centre of the island, following a little path through a matted wood, rendered impervious by creepers, we came one day on the first symptoms of cultivation of the ground we had ever seen among the aborigines of this part of the world. This was a little circular plot of ground, not more than four or five yards in diameter; but it had evidently been dug, though in a rude manner, and in it were set several young plantain-trees, one or two other plants, and two trailing plants, somewhat like French beans in appearance, which we afterwards found were a kind of yam. The huts on this island had the appearance of a first attempt at a house, having side walls about two feet high, and a gable-shaped roof rising four feet from the ground. They were about ten feet long and six feet wide, made principally of bamboo, and thatched with grass and leaves. They stood in a picturesque little spot, backed by some huge blocks of sienite, on which some large shells were arranged. About fifty yards from them, under some widely-spreading, thick-leaved trees, with gnarled trunks and twisted boughs, were some great blocks of sienite, resting fantastically one upon the other, that, with the dark shade of the grove, put us in mind of the old traditions respecting the worship of the Druids.

In all the wood that spread over the island, there did not appear to be a single gum-tree: the trees

were widely branched, low and umbrageous, and matted with underwood and creepers. The whole aspect of the vegetation was totally different from that of Australia.

While we were in this neighbourhood, about the end of February, great flocks of the bea-eater, which is common in Australia (merops ornatus), were continually passing to the northward. The white pigeons, also (Carpophaga luctuosa), were going in the same direction in numerous small flocks, and in March all the pigeons left in the islands were young ones. The bee-eaters go as far to the southward as Sydney during the summer of New South Wales, but we never saw the white pigeons much to the southward of Torres Strait. In September, 1844, they were coming thickly from the northward to Endeavour Strait, and they seem to return in March. What can be the reason of this migration? In these latitudes it is evident that mere temperature cannot be the cause of it, although the variation of the seasons for different fruits or insects may. I had afterwards strong reasons for suspecting that even on the opposite sides of so small a space as Torres Strait, not more than 120 miles, the seasons are totally different: that the wet season prevails in New Guinea between March and October, which, on the north of Australia, is the driest part of the year; while from October to March, when most rain falls in Australia, it is probable that the south coast of New Guinea has its driest weather.

CHAPTER VII.

ISLAND OF OOMĀGA—INTERVIEW WITH NATIVES—DAMOOD —INTERVIEW WITH NATIVES—THEIR HOUSES, GARDENS, WATER-HOLES — CURIOUS PIPE—MASSEED — INTERVIEW WITH NATIVES—OLD GARĬA—HOUSES—CURIOUS CARVING OF BIRD AND FISH—DARNLEY ISLAND, OR ERROOB—ITS ASPECT—INTERVIEW WITH NATIVES—THEIR HOUSES, GARDENS, TORTOISE-SHELL MASKS, WIGS, BOWS AND ARROWS, DRUM, IMAGES, YAMS, TOBACCO, SUGAR-CANE —WALK OVER THE ISLAND—ITS VOLCANIC ORIGIN—HEIGHT BY BAROMETRIC MEASUREMENT—NUMERALS USED BY THE PEOPLE.

March 17, 1845.—We landed on a little island about four miles north of Masseed. This was a flat island, about a third of a mile long, with an extensive coral reef on its eastern side. Piercing through the little belt of dense scrub which intervened between the beach and the wood, we got among a grove of lofty forest trees, with spreading boughs and leafy branches, affording a most agreeable shade. This wood formed a striking contrast to the hot, dry, shadeless gum-tree forests of Australia. A great number of white pigeons had bred in these trees, and the young ones were still lingering about them, although all the old ones seemed to have disappeared. I found also a species of helix, first ob-

MAMMOOS GARIA

NATIVES OF MASSEED.

served at Turtle-backed Island, but which lay here in considerable quantities under the dead leaves and branches.

Soon after we had landed, one of the boat's crew came running to me to tell me the natives were coming to the island in canoes, and as this was the first time we had met the islanders (except at Murray Island, in 1843), we assembled on the beach to receive them. Only one canoe came to us, in which were three men and three boys. They approached us, unarmed, with the utmost confidence, one man holding a cocoa-nut in one hand and a green bough in the other. They all shouted "Poud, poud, poud Masseed!" meaning 'Peace! peace with Masseed!' They were a well-made, fine-looking people, of a different type from the Australians, with muscular limbs and frizzled hair. They had the oval epaulet-like mark on the shoulders, but no other scars. Their hair was dressed into long, narrow, pipe-like curls, smeared with red ochre and grease, and they wore a band round the forehead. One old man, who informed us his name was Garĭa, had a black wig dressed like their hair, but his beard and whiskers were nearly all grey. They understood the words we had picked up at Cape York, and they knew three English words, "water," "knife" (pronounced "nipa"), and "ship," which they called "shippo:" these they had probably learnt from whalers. They seemed fond of smoking. Their canoes resembled those we had seen in

Endeavour Strait, but larger and more ornamented.

They asked for "tooree" (iron), but on our saying we had none ashore, and pointing to the ship, they went off to her in their canoe; one man remaining with us by himself, and going off in the whaleboat, shewing their perfect confidence in our good intentions. On board they made themselves quite at home. Old Garia requested to have his grey whiskers shaved off. They sat with us at dinner in the gun-room, eating biscuit, but would not touch pork, as they evidently seemed puzzled to make out what it could possibly be. Having no large land animals of their own, we were not quite sure they did not suspect it to be man's flesh. They informed us the name of the small island near which we were was Oomāga, and gave us the names of the other islands in sight, which agreed in the main with those assigned to them by Mr. Lewis in the journal of his search for the survivors of the Charles Eaton.—(See *Nautical Magazine* for 1835).

March 21.—We anchored near Dalrymple Island, which the natives call Damood.* A canoe, with fourteen men in it, pushed off from the island; but as Capt. Blackwood, with Mr. Melville and myself, were going ashore in the first gig, we met them, and they went back with us. On exchanging shouts of "poud! poud!" and waving green boughs, we immediately

* The names of Tood and Damood, as given in Captain King's chart of Mr. Lewis's track, ought to be transposed.

became good friends. It was high water, and we passed over the reef in our boat, and landed close to a large group of huts. Ten men waited to receive us here, two or three elderly women crawling off into the bush, where the younger women and children had previously hidden themselves. The men received us most cordially, though with much clamour and gesticulation; and the others having landed from the canoe, led us between the huts to a clear open space at the back of them, shaded by cocoa-nuts and other trees, and which seemed the place of public meeting of the village.

The huts were by far the neatest and best erections of the kind we had yet seen. Each one occupied a quadrangular space, six to eight feet wide, and from ten to fifteen feet long. They had gable-shaped roofs, eight feet high in the centre, and sloping on each side nearly to the ground. The frame of the house was made of bamboo, and thickly covered or thatched with grass and palm-leaves; the front and back walls were also made of small bamboo sticks, upright and fastened close together, the front wall having a small triangular opening for a door, over which hung loose strips of palm leaf. The door looked into a little court-yard, of about ten feet square, in front of the house, strongly fenced with stout posts and stakes, interlaced with palm leaves and young bamboos, and accessible only by a very narrow opening between two of the strongest posts. In this court-yard was

the cooking fire. The different huts and fences were rather irregularly disposed, but placed closely together, so as to leave only narrow winding passages between them. They occupied a space fifty or sixty yards long, by ten or fifteen broad. Behind them was the open place of meeting, on the other side of which, against an old tree, was a semicircular pile or wall of dugongs' skulls about three feet high, many of which were quite fresh, but others rotting with age; in the middle of this was a conical heap of turtles' skulls in a similar state. There must altogether have been some hundreds of skulls of each kind of animal.

When they had conducted us into this open space, several of them seated themselves on small well-made mats, like those used by the Malay nations; and two or three went and brought a large roll of matting, at least 12 feet by 6, which they spread for us to sit down on. These really well-made fabrics greatly surprised us, after being accustomed to the non-manufacturing Australians. They then brought us young cocoa-nuts, tortoise-shell, and ornaments, and a great barter commenced. They gave us cocoa-nut water, without waiting to receive anything for it, but for the other things they would only accept tobacco and iron implements, paying no regard to our beads and gaudy handkerchiefs. They brought us two small bananas or plantains, but we could not see the trees on which they grew. They suffered Captain

Blackwood and myself to stroll about the huts unattended, while they bartered with the boat's crew. We found in the court-yard of one hut, a ship's cabin-door, painted green, and not very old; in another, a quaker gun, set upright in the ground, and the men said they saw pieces of "Queen's line" among them. They had used pieces of iron hoops, and a long iron spike, to open the cocoa-nuts, but these they might have procured from passing vessels. The door and the wooden gun, however, must have come from a wreck.

At the south end of the huts we came to a building much superior to, and different from, any of the rest. It was like a Malay house unfinished, or one of their own smaller huts raised on posts to a height of six or seven feet. The point of the gable was at least fifteen feet from the ground, the roof being supported at each end by two stout posts, about a yard apart, having their tops ornamented by carved grotesque faces, painted red, white, and black, with much carving and painting below. The lower part, or ground-floor, of this building was open all round, except at one end, where a broad, rudely-constructed staircase led to a platform, from which went the entrance to the upper story: this was floored with stout sticks, and at this end covered with mats; this part was also partitioned off from the other by a bamboo screen. Under the roof hung old cocoa-nuts, green boughs, and other similar things, but nothing to give a decided clue

to the object of the building. Whether this was their temple, their place for depositing the dead, or a chief's house, we could not make out. We, however, saw no appearance of any chief, or of one man exercising authority among them, neither could we discover any traces of religious belief or observance.*

We now struck off for a walk across the island, one of the natives coming with us as a guide. Many narrow paths crossed in all directions, among shrubs and bushes, some of which resembled laurels and myrtles, in their leaves and modes of growth. Groves of lofty forest trees occurred here and there, with matted creepers and thick jungle. Several trailing briars, with thorns like the European bramble, were observed; and, in short, the whole vegetation had a totally different aspect from that of Australia, and a much greater resemblance to that of Europe or Asia. Our native conducted us to some water-holes, which he seemed to think were the object of our search, frequently repeating "water, water," which he pronounced very well. These water-holes were large irregular excavations in the sand, fully ten feet deep, and near the middle of the island. At the bottom of each excavation

* This house resembled the smaller houses we afterwards saw in New Guinea, and it may have been erected merely in imitation of those the islanders have seen in that country. We afterwards saw, on Masseed, a solitary house like those of Darnley and Murray Islands.

was a little hole containing a few inches of fresh water, carefully covered from the sun by sticks and lumps of wood. We passed several spots which seemed to have been partially cleared and undergone some cultivation, in which were long kidney-bean-like plants climbing up sticks. We afterwards discovered these were "ketai" plants, a kind of yam.

Seeing some white pigeons, we explained to the native what we were going to do, and went after them, and he seemed greatly surprised and delighted at seeing them brought down on the wing.

On returning to the huts we purchased all the cocoa-nuts they could spare to take on board. On giving a man a cigar he begged from me, he took up what I had previously imagined a musical instrument, which I now found however to be a pipe. This

was a piece of bamboo, about two feet long, and two inches in diameter; it was partly open at one end, and had a small lateral hole, near the other extremity. Into this lateral hole he fixed a hollow conical piece of wood for a bowl, making it air-tight by wrapping a leaf round it, and then sticking the cigar into it, and lighting it, he applied his mouth to the large orifice at the other end of the bamboo,

and commenced sucking. No smoke coming out, I took the cigar from the bowl, and told him he had better put it into his mouth at once. I found, however, I was quite wrong, so re-fixing the cigar, he recontinued sucking until he had filled the bamboo full of smoke, then removing the bowl, and keeping his hand loosely over the larger orifice, he sucked back the smoke from the small hole, and having taken a draught of smoke himself, and *swallowed it*, he passed the bamboo to his neighbours, who followed his example.

This proceeding seemed to me not a little curious, but we had then no time to stay to examine farther, and taking an affectionate farewell of our native friends we returned to the ship.

March 22.—We were to-day again anchored near Oomaga, and Captain Blackwood, with Mr. Sullivan and myself, went in the cutter to visit Masseed, while a large canoe with seventeen people, among whom were several women, came from that island to the ship.

We landed first of all on the south end of a little island, called Cudal, where we met Garia, the old fellow who had been on board the other day with two boys his sons, and two women, and another man. They received us very frankly: the women also came up to us after a little persuasion. The latter had their frizzled hair closely cropped all over, except a ridge about half an inch high, running from one ear to the other, over the crown of the head.

We found Cudal a mere strip of sand, on the same reef as Masseed, and connected to it by a bank, dry at half tide. Garia was very eager for us to go to Masseed, and got into the cutter with his two sons, to pilot us over the reef, sending the women and other man to wade across. We found the reef so shoal, that as the tide was falling we could not venture so far upon it as to get the boat aground, so taking off our jackets, and holding them with our guns over our heads, we waded ashore. We found several women and children waiting for us at a group of huts, exactly resembling those of Damood, to which Garia pointed, and said, he had seen the ship go there. The women were no great beauties, being middle aged, with closely cropped hair, and breasts flat, skinny, and pendulous. They were, however, decently clothed, with a sort of petticoat of leaves, reaching from the waist to the knee. They carried their younger children, like the Malays, astride across the hip, and seemed still to be suckling several, who appeared three or four years old.

We then went for a walk along the south side of the island, old Garia accompanying us. About half a mile from the village, we came to a single hut, of a different shape from any we had yet seen. It was just like a great bee-hive, ten or twelve feet in diameter at the base, and the same in height, having a thick thatch of grass. A pole protruded from the summit, on which was a large shell (fusus), and a small hole or door

at one side, partly covered by a board of wood. We thought at first, it might be the receptacle of the dead, but at Darnley and Murray Islands almost all the houses are of this form, so that this had either been erected in imitation of them, or by some people of those places when on a visit to Masseed. We found in the centre of the island two water-holes like those of Damood, to which Masseed had indeed a precise resemblance, except that it was rather larger. On going off, Mr. Sullivan bought from one of the houses, for some tobacco, a curious ornament. It consisted of two rudely carved figures of fish, about two feet long, connected together by cross pieces, about one foot long, over which frame

CANOES OFF ERROOB.

was a large figure of a bird, with an immense toothed bill, the eyes and some other parts cut out of mother-of-pearl, neatly inlaid. It was altogether two and a half feet high, and by no means badly designed or executed. Where they could have seen the bird we could not conjecture, but it bore a very great resemblance to a horn-bill, and it was probably meant to represent one of those birds, which very likely inhabit the neighbouring part of New Guinea.

March 28, 1845.—We anchored to-day on the west side of Darnley Island, or Erroob as it is called by its inhabitants, and by which name I shall designate it for the future. We came to, about half a mile from the shore, in eighteen fathoms water, opposite a small village called Keriam, with the peak of the island bearing east-south-east, but afterwards found a rather more commodious anchorage in Treacherous Bay, a little further to the north-east, opposite another small plantation called Beeka.

Erroob was quite different in appearance from all the other islands we had seen, except Murray Island. It was lofty and broken, rising more than 500 feet above the sea, but covered with vegetation, and exhibiting none of the bare rocky mounds characteristic of the granite islands about Mount Ernest. We afterwards found that, together with the group of the Murray Islands, it had a distinctive geological structure, being of volcanic origin, while the line of islands between Cape York and Mount Cornwallis are all granitic or old metamorphic

rocks, and those between that line and the volcanic islands of Erroob and Murray group are all flat coral islands.

Captain Blackwood, Mr. Bell, and I landed in the afternoon at the small group of huts near us, which we afterwards found was called Keriam. A crowd of 50 or 60 people awaited us, waving green boughs, shouting "poud, poud," and inviting us ashore. As soon as we stept on to the rocks, we were surrounded by the natives, all shouting, shaking hands, offering "boonārri" (cocoa-nuts), "kaisu" (tortoise-shell), and asking for "sapăra" (axes). As we were yet unacquainted with the meaning of these words, and all we had heard of the islanders was by no means in their favour, we kept pretty much on our guard at first; but seeing many women about, several of the elder of whom now came and shook, or rather scraped, hands with us, and the evidently friendly and delighted manner of the people, we soon dismissed all anxiety, though not all caution. Our principal object now was to get some yams or other vegetables for the ship's company, but in this we did not succeed, as though single yams and cocoa-nuts were offered us they did not appear able to afford a sufficiently large quantity at once.

The men were fine, active, well-made fellows, rather above the middle height, of a dark brown or chocolate colour. They had frequently almost handsome faces, acquiline noses rather broad about the nostril, well-shaped heads, and many had a singularly Jewish-cast of features. The hair was frizzled,

and dressed into long, pipe-like ringlets, smeared sometimes with red ochre, sometimes left of its natural black colour; others had wigs, not to be distinguished from the natural hair, till closely examined. The septum narium was bored, but there was seldom any thing worn in it. Most of their ears were pierced all round with small holes, in which pieces of grass were stuck, and in many the lobe was torn and hanging down to the shoulder. Their only scars were the faint oval marks on the shoulder. The hair of their bodies and limbs grew in small tufts, giving the skin a slightly woolly appearance. They were entirely naked, but frequently wore ornaments made of mother-of-pearl shells, either circular or crescent-shaped, hanging round their necks. Occasionally, also, we saw a part of a large shell, apparently a cassis, cut into a projecting shield shape, worn in front of the groin. The women wore a petticoat round the waist, reaching nearly to the knees, formed of strips of leaves sown on to a girdle. These formed a very efficient covering, as one or two were worn over each other. The grown-up woman's petticoat, or "nessoor," was formed, we afterwards found, of the inside part of the large leaves of a bulbous-rooted plant, called by them "teggaer," of which each strip was an inch broad. The girl's "nessoor" was made of much narrower strips from the inside of the leaf of the plantain, which they call "cabbow."*

* One of each of these kinds of petticoat have been deposited in the British Museum.

The younger women were often gracefully formed, with pleasing expressions of countenance, though not what we should consider handsome features. The girls had their hair rather long, but the women had almost all their hair cut short, with a bushy ridge over the top, to which they, singularly enough, give the same name as to pieces of tortoise-shell, namely, " kaisu." Many of the elder women had their heads shaved quite smoothly, and we never saw a woman wearing a wig, or with the long ringlets of the men. At our first landing, all the younger women and girls kept in the back-ground, or hid themselves in the bush. On strolling to the back of the huts, we found a small native path, along which we went a short distance, till we came to a rude fence in front of a plantain-ground, where the men objected to our going further, and we heard the voices of the women among the trees beyond.

There were four huts at this spot, all bee-hive shaped, sixteen feet in diameter, and as much in height. They stood in small court-yards, partially surrounded by fences formed of poles of bamboo, stuck upright in the ground, close together, and connected by horizontal rails, to which they were tied by withes. Inside the huts were small platforms covered with mats, apparently bed places; and over head were hung up bows and arrows, clubs, calabashes, rolls of matting, and bundles apparently containing bones, which they did not like our examining. Outside the huts were one or two small open sheds, consisting merely of a raised flat roof,

to sit under in the shade, and a grove of very fine cocoa-nut trees surrounded the houses.

Near the path leading to the plantain-ground was an old stump of a tree, three feet high, that had been rudely fashioned at top into the figure of a human face. I thought at first it might be an idol, but they seemed to pay it no reverence, laughing when I pointed towards it, pulling its nose and then pointing to their own, gave us their name for nose, "peet." It was therefore probably merely made for amusement. After a walk along the beach, under some cliffs towards Treacherous Bay, we returned to our boat, and, having thus effected an introduction to these people, went on board. Two of the natives insisted on going off with us, and we took them in the boat accordingly. Their names were Mammoos and Seewai; and we afterwards found they were two of the most influential men of the island. They seemed quite confident; but when they got alongside and saw the guns projecting over their heads, they were rather alarmed, and said very earnestly once or twice, "poud Mammoos! poud Seewai!" After being on board some time, and having some presents given them, and promising to bring off plenty of yams and plantains, they were sent ashore in the whale boat, which Seewai insisted on steering, and did it very well.

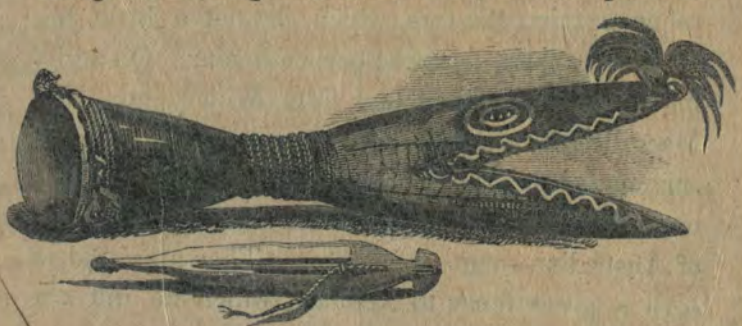
March 29.—A large party of us landed this morning at Keriam, where a number of natives from all parts of the island were asembled. Groups

of women were sitting round small fires cooking the kind of yam called "ketai," and other roots; but they had few more than they were actually consuming. An active barter immediately commenced with our boats' crews, in which tortoise-shell, bows and arrows, and other curiosities, with some cocoa-nuts, were exchanged against knives, axes, and tobacco. Melville and I, with my attendant Johns, slipped out of the crowd and walked along Treacherous Bay, where I wished to examine the rocks. When we had gone about half a mile, we heard a native hallooing after us, and he overtook us as we were climbing up some steep ascents at the east end of Treacherous Bay, by a native foot path. He was a fine handsome young fellow, who said his name was Duppa. On the top of the ridge, among some dense jungle, we found several small huts, of a rather different construction from those below, but they seemed uninhabited. Duppa here shouted aloud, and apparently received an answer inaudible to our ears. We then followed the path into a little valley, opening on the north-east corner of the island, and fronted by a large bed of mangroves, and on the opposite rise came upon a large plantain-ground. This was about half an acre in extent, rudely fenced and imperfectly cleared. The plantains seemed healthy, but there was little or no fruit on them. The ground here, as elsewhere, seemed rich, consisting of a dark brown unctuous loam, and would, I think, be well adapted for coffee-plantations.

From this point, we climbed up a small hill on our right, and found ourselves separated from the main hill of the island by a very pretty valley opening to the south, covered with long waving grass, and patches and skirts of woods and thickets. The south side of the hill also was covered with grassy slopes. From the little hill on which we stood, we saw the Murray Islands to the southward, with immense reefs stretching from Erroob in that direction, and also large reefs running several miles to the north-east, and ending near a large sand bank, which Duppa called Mĕrad.

Descending into the grassy valley, we found a very good native path running along it across the island from north to south, a distance here of about a mile. In the middle of Treacherous Bay, at a little bight called Beeka, we met on our return several natives near an old hut and a grove of cocoa-nuts. We offered them cigars to get us some young cocoa-nuts, and a boy literally walked up one of the trees, without any other assistance than his hands, to get us some. He kept his body very much bent, and his hands and feet almost close together, the one grasping, the other pressing the tree, which slanted a little, but not very greatly, from the perpendicular. On arriving at Keriam we found Mr. Millery and Mr. Macgillivray, with his Port Essington boy, Neinmal, surrounded by the Erroobians, and on excellent terms with them, having amused them by imitations of Australian songs and dances. They appeared to take a great fancy to Neinmal, which he did not

very cordially reciprocate, saying, he would not like to stay with them, for fear they should eat him. Macgillivray had had his pocket picked of his powder flask, and as it was better to put a stop to this kind of operations at once, we determined to have it restored. Taking our guns in our hands, we assembled together, with very grave faces, and producing my flask, we explained, by signs, that a similar one had been stolen, and that it must be returned. None of them, at first, seemed to know what was the matter, but after some palaver, we observed a boy go to one of the huts, and immediately on his return he pretended suddenly to find the flask on the ground where we had been sitting, and brought it to us. This passing off, we sat down again, and renewed our friendly intercourse. Seeing me very hot, they brought me a cocoa-nut to drink, and then a group sitting down around me, commenced blowing in my face to cool me, a process with which I very shortly dispensed. On the dances being resumed, one of the men went and fetched a drum. This was in shape like a very elongated hour-glass, made of a hollow piece of



wood, open at one end, with the skin of a lizard stretched tightly over the other. On being beaten by the hand it emitted a low resonant sound.

The women were now become a little more familiar, standing or sitting round in groups; on our approaching one of which, however, the younger ones laughingly hustled over to the other side. The men seemed amused at their coquetry, and some of the younger fellows made a shew of offering one or two of them to us, using rather coarse gestures, at which there was a general laugh. It seemed all to be done however in jest, as I may mention here that no instance of a breach of chastity by any of the women of these people came to our knowledge during the whole of our intercourse with them; although, as may be easily believed, there was no want of solicitation on the part of our ship's company, nor any want of means of inducement, since they look upon all iron implements as the most valuable of commodities. This reserve of the women seems characteristic of the frizzled-haired races of these seas, as distinguished from the straight-haired Polynesians, as may be seen in the accounts of all voyages from the time of Cook downwards.*

A fine straight-limbed and graceful young fellow, called Doodĕgab, had attached himself to me, and I proposed an exchange of names to him, a custom of which we had yet seen no traces, but which he in-

* See especially his account of New Caledonia in his second voyage.

stantly seemed to comprehend, and for some time called me Doodĕgab, while he assumed my name, which he pronounced as if spelt Dookees.

They all seemed to be everlastingly eating, now a plantain, then a ketai, then a cocoa-nut, with occasional "plâts" of small fish, or of roasted shell fish, principally trochus, and sometimes crabs, and other crustacea.

As I had a curiosity to see where the path at the back of the huts went to, I strolled along it, but was presently stopped by a man who called me back, and detained me till two young girls came down the path with a large shell full of water. He then seemed no longer to have any great objection to my proceeding, and Doodegab coming up accompanied me. The path led through a small plantation ground, and then by the side of a small dry water-course, for three or four hundred yards, till it came to a water-hole, in which there were several gallons of fresh water, of very middling quality.

A boat now came ashore, with Mr. Bell, to try and get some vegetables which they had promised to have ready. He only succeeded, however, in getting a few branches of plantains for several axes. I purchased for a knife a curious tortoise-shell mask, or face,

made to fit over the head, which was used they told me, in their dances. It was very fairly put together, with hair, beard and whiskers fastened on, projecting ears, and pieces of mother-of-pearl, with a black patch in the centre for the eyes.* A great number of bows and arrows having been bought, they were now busy in making new bows, but I did not see any new arrows, nor did we ever find on the island the reeds of which they are made. The bows are made of the upper part of a stout bamboo, partly split in half, flattened and bent over the fire. The string is a broad strip of the tough outer rind of a bamboo, and the fastenings are very ingeniously and firmly made. The bows are large, and very powerful, some being more than seven feet long, and in the centre more than three inches wide, and an inch thick. They shoot their light long arrows to great distances, but not, I think, with very accurate aim. Their arrows vary from three to five feet in length, the common ones being pointed only with hard wood, variously jagged and barbed. The war arrows, however, are much larger and heavier, the hard wood part being very thick and square, and elaborately carved, with a sharp bone point and barb made and fitted like the spears of Australia. The shaft is always a light cane or reed, without feathers. In using the bow the men always wear on the left arm a stout armlet or gauntlet, reaching

* This and all the other native implements and curiosities I collected, are now in the British Museum.

from the hand to the elbow, made of woven grass, to defend the arm from the rebound of the string.

Seewai, Mammoos, Kĕouck, and Duppa went off to the ship with us. I shewed Duppa some plates of animals and shells. Most of the animals he called "omai," or dogs; but to the deer he gave another name, as if acquainted with one. To the shells he gave a great variety of names, of which a list is given in the vocabulary. They have a few dogs among them, not greatly differing from those of Australia, but apparently more thoroughly domesticated. Several of them were white.

March 30.—This morning some canoes came off to us, in which were one or two women. One man had lost the whole of his nose from a cancerous or cutaneous disease, with which several of them were more or less affected. It usually shewed itself on the lips or face, or about the pit of the stomach, where it sometimes formed a complete circle of ulcers. Dr. Muirhead said it was a kind of lupus, or "noli me tangere." Besides this disease, swollen legs and enlargement of the limbs, called, I believe, elephantiasis, were very common. There were also several cases of enlargement, apparently from rupture. They brought several bunches of plantains, but as it appeared that each bunch belonged to a different person, and that each wanted an axe for his bunch, and we could not afford these terms, we let them take them ashore again.

In the afternoon I went round with Lieut. Risk

to the south side of the island, to look at a water-hole which had been seen there. Duppa accompanied us, and took us first to a small hole, with a little trickle of water, about half a mile south of Keriam. He then left us, and we proceeded.

The south side of the island is by far the finest. It has beautiful grassy slopes, from the woody summit of the hill down to the belt of wood along the shore. The coast is indented by sandy coves, separated by little rocky headlands, and in each cove is a small group of huts under the shade of a grove of cocoa-nut trees. Several very fine canoes were hauled up on these sand-beaches near each group of huts. Sandy flats, dry at low water, stretch out two or three hundred yards from the beach, covered with native weirs for catching fish. These are walls of loose stone, about three feet high; formed in curves and semicircles along the sand-flats, each having a radius of one or two hundred yards. They are completely covered at high water, but when the tide falls, (its range being about ten feet,) many fish are left within these enclosed spaces, or, together with crabs and other sea creatures, caught in the interstices of the stones. Outside this belt of sand-flats is another of coral reef of irregular width. Towards the south-east both coral reefs and sand-flats stretch out for miles, with many narrow deep channels and holes between them. Here and there along the shore, both on the beach and out on the sand-flats, were erected tall bamboo

poles with long streamers of leaves attached to them, but what was their object we never could discover. I am inclined to believe they are mere boundary marks between the different fishing-grounds of each village or small group of huts. We landed about the centre of the south side of the island, at a place called Moggōr, where was a very pleasant spot that we afterwards found belonged to our friend Seewai. Two or three good huts were enclosed by a large and lofty fence of bamboo poles very firmly fastened together; behind which, in a little valley, was by far the best garden in the island, watered by a little running stream that formed a small pool behind the beach. The soil was very rich, deep and black, and the plantain-trees very luxuriant. Very fine groves of cocoa-nuts stretched along the shore, abundance of the ripe nuts lying on the ground apparently disregarded. Most of the people were absent, being attracted to Keriam by the presence of the ship. Two old women, an old man, and some children, however, were in a neighbouring hut, who received us very civilly. There was abundance of good water* here to water our ships with, but it was in an inconvenient situation, as the casks would have to be rolled some distance over the sand-flats and reef, and then taken three miles to the anchorage.

As we were going off to our boat again, a young

* This water seemed to be permanent, as it was in the same state when we were here again at the latter end of May.

man, named Dzoom, came down and asked for a passage round to Keriam. In going along he gave us names for each of the little villages we passed, of which the principal were in regular order the following: Moggōr, Badōga, Maedha, Zhee, Keriam; the hill he called Pasaer.

March 31.—I landed this morning at six o'clock with my attendant Johns, to go all over the island. We first of all went to the little rill of water near the N.W. point of the island, and went up into some good plantain-gardens behind it; beyond these were some spaces of bamboo, much cut; but behind these, again, we came to a dense, impenetrable thicket. We were then obliged to scramble down by a dry water-course to the beach, and then proceeded to Keriam, to try the path at the back of the huts. After some little opposition to our proceeding by this, I got two boys to come with us, and they then let us go. The path was very narrow, and it wound for about half a mile through the thickest woods, matted by impenetrable creepers and underwood, till it came out on the brow of a rising ground, where the wood had been partially cleared, and some very extensive "ketai" (yam) plantations formed. Several acres of ground here were very tolerably fenced in and pretty fairly cleaned, the old stumps and branches of trees being left for the ketai plants to be trained upon. A grove of cocoa-nuts crested the summit of this hill, which was probably about 250 feet above the sea. This place was called "gedoop," which is, I believe, their general word

for garden or cultivated ground. A little beyond this we came out on the grassy slopes of the south side of the island, furrowed by little narrow valleys full of wood, stretching from the hill on our left to the sea-beach, with its belt of cocoa-nut trees on our right. As we had a very good foot-path through the long tangled grass, we had a most delightful walk, the fine fresh breeze of the S.E. trade wind moderating the heat of the sun. The grass was generally excellent: long, fine, green, and juicy; but here and there were patches of a broad-bladed and ranker grass, more like the alang alang of Java. When we had arrived at the back of the cove of Moggòr, our two boys refused to go any farther, and wanted us to come down and have cocoa-nuts; and as we persisted in proceeding, they left us.

Crossing a small gully with a deep water-course, now dry, we came on another grassy slope; but here the path turned for the beach, as a great belt of woods came sweeping down from the hill. In walking along the beach, we came on several huts we had not yet visited, but which were now shut up, their inhabitants being probably at Keriam. Near one of these huts was a stump of wood that had been rudely carved into the human shape, representing a woman. Just before it, on the ground, were several old large murex-shells, and behind it was arranged a series of split cocoa-nut shells, in a semicircular form.* Whether they attached any

* This figure was 5 ft. 6 in. high. It had holes at the sides of the head, apparently for ears to be fixed into, and others at the

religious or superstitious notions to it, or it was merely the amusement of their leisure hours, I had no means of judging; but as they are fond of ornamenting all their implements with carving, and I never saw any traces of religious feeling among them, I am inclined to believe the latter would be the most probable supposition.

A little beyond this we came to a cove so full of mangroves, as to be almost impassable; so, finding grassy slopes behind it, we struck up on to them; and seeing a pretty clear space leading to the top of the hill, climbed up it. After some toilsome scrambling through a thicket, in which we got in-

shoulders for the arms. The border round the legs represents the nessoor, or petticoat. The eyes were pieces of mother-of-pearl, with spots of black gum on them. It had all been painted red.

volved, we reached the summit, which on the south side was bare, but surrounded with lofty trees all round the northern half, which shut out the view in that direction. There was a slight hollow on the summit, surrounded by a ridge of higher ground, but I could not say that it had been a crater; neither was the hill regularly conical, but rather a broken ridge, higher in the centre than elsewhere. The rock was a heavy, dark, rather crystalline lava, or trap, slightly cellular occasionally. On descending, we found in the water-course in the bottom of the gully, leading out to the mangrove cove, some water-holes, containing very good water, with a little trickling stream from one to the other. Abundance of water to supply the island the whole year round might be preserved, either by digging holes or raising dams in these gullies, and thus storing the rains which fall during the N.W. monsoon.

We were now in the little valley in which we had been with Duppa the other day, and had thus made the circuit of all but the extreme east end of the island. As we felt rather tired, we left that for another day, and returned by the path to Keriam. Here we found many natives assembled, who immediately supplied us with cocoa-nut water, and seemed very much surprised when we told them we had been on the hill which they called "Pasaer," and they were evidently puzzled to know what we could possibly want up there. We saw in our walk to-day very few land birds, consisting only of three quails

and a blue and yellow bird, that flew like a parrot. Curlews, godwits, and plover were plentiful on some parts of the beach, and may sometimes be seen on the hills where the curlews occasionally perch on the trees.

Some of the natives to-day were sucking pieces of a dark brown, rather coarse, sugar-cane, and we saw some of their tobacco, of a light brown colour, twisted into a plait. I nowhere saw either of these plants growing, so that probably they keep their plantations in small secret spots in the woods. Whence could these people derive the habit and their very peculiar method of smoking? European vessels passing through the strait might have given them manufactured or dry tobacco, but they could not have given them the plant or taught them how to cultivate it. In smoking their own tobacco, they break off a piece from the plait into which the leaves are twisted, and wrap it in a green leaf to prevent its setting fire to the wooden bowl. A woman is then deputed to fill the bamboo with smoke, as before described, and on its being passed round, each person takes a long draught of smoke, which *he swallows*, apparently with considerable effort, and stands motionless a few seconds, as if convulsed, with the tears in his eyes; he then respires deeply, and seems to recover. They call it "eree oora" (to drink heat or fire), and, patting their stomachs, seem much comforted after it. I tried their tobacco, but found it intolerably hot and strong. They could

not have learnt to smoke from any of the Malay nations, since those people, even if they ever reached thus far, rarely or never smoke tobacco, but only chew it with their betel. All the evidence seems to me to be against the notion of tobacco, or the custom of smoking it, being indigenous in the east, and in favour of its having been introduced by the Portuguese, and Spaniards, and Dutch, after the discovery of America. Can the habit of smoking have spread from the Philippines through New Guinea into Torres Strait, or has the custom and the plant been introduced from the south-eastward, from New Ireland, or New Caledonia, where, I believe, we must look for the paternal seats of the Torres Strait Islanders?

I was dining to-day with Yule on board the Bramble. There were two young natives on board, to whom I pointed out a young pig that had just been killed, and which was hanging up forward. They at first called it "omai" (a dog), but on my shaking my head, and saying "lola, lola' (no, no), they called it "burroom," a word I afterwards heard applied to some boars' tusks I saw among them, and which came from New Guinea. There were two sheep on board, with which they were much puzzled, but at last called them "burroom" too. On seeing some onions, they asked for some of them, and promised to set them in their gardens ashore.

I have no doubt that they might be very easily taught to cultivate the ground to a much greater

extent than they now do, as also to keep sheep, pigs or poultry, as they seemed very fond of pets, and had one or two tamed pigeons and boobies among them. As it got dusk, the two young natives became so uneasy at being on board, that Yule sent them ashore again.

April 1, 3.—I got old Mammoos on board to give me his names for all the shells I had collected in the neighbourhood, a list of which will be found in the vocabulary. He had almost as many names as there were genera, and for some species of one genus he had different names. These names of course only referred to the general form, as, for instance, murex, auricula, and cassis, having all wrinkled mouths, were called "ass;" pyrula, fusus, triton being all longish shells, were "mabaer;" a species of arca, corbis, and psammobia, having a general resemblance in form and wrinkles, were all "kaip." Still there were many more distinct names for the different shells than we have in common English, where all bivalves are called either oysters, or cockles, or mussels, and all univalves, winkles, or limpets, or snail shells.

Remarks on their language will be found in the appendix attached to the vocabulary; but I may mention here its great superiority in sound and distinctness of enunciation to the jabber of the Australian languages. They took also great pleasure in teaching us their names for things, another characteristic in which they differ from the Australians.

I heard that a yellow, naked-tailed opossum, called "barreet," had been seen ashore in a cage, and made many endeavours to see it, in order to purchase it. They always evaded my inquiries, however, and assured me it had gone into the woods to eat; and, though I offered an axe and other things for it, and they promised to bring it, I could not get even a sight of it.

We had found a good water-hole in the cove in Treacherous Bay, called Beeka, and by deepening it a little, got a very good supply for the ship. It was in a plantation belonging to Mammoos, and he insisted on being paid for it. This, however, was not a permanent supply, as on our return at the end of May, it was quite dry.

Captain Blackwood and I measured the height of the hill barometrically, his barometer giving a height of 564 feet, mine of 556 feet above the sea. The height deduced from the survey trigonometrically was 615 feet, but this was to the tops of the trees on the highest point, full 50 feet above the place where we observed.

Duppa came down one day with a very gay head dress, which we only saw on this occasion. It was a fillet crossing over the head, from which proceeded a semicircle of large white feathers, vandyked at the edges, radiating round his head like a glory. He was a very good-looking fellow, and, with this ornament, seemed quite the D'Orsay of the island. He assembled several of the younger men and women,

and took them on board. He left his wife ashore, however, who was pointed out to me at the watering-place. She was of a rather lighter colour than the rest, had a peculiar raised mark down each breast, and was said to come from Poorem, which, as far as I could make out, lay somewhere to the south-west. There were several other women, not natives of the island, but whether they had come voluntarily or had been brought as prisoners taken in war I could not learn. One was said to come from Dowdee, which we afterwards learnt was their name for the nearest part of the coast of New Guinea. She differed from the rest chiefly in colour, being of a light yellowish brown, in the orifice through the septum narium, which was very large and prominent, and in her scars or tattoo marks, having figures on her breasts, shoulders, and calves of the legs, the latter of which apparently represented crocodiles. The women of Erroob are not at all marked either by scars or by tattooing.

On the afternoon of the 3rd, I walked by myself, and apparently unarmed, having only a pistol in my pocket, with a native man, named Warro, and a boy, called Goua, round the eastern end of the island to a village called Kaiderry, where I had not yet been. Here I found several people whom we had not seen, and who appeared quite delighted to see me. I sat with them some time amusing them, by shewing them my pocket telescope, compass, measuring tape, and dog-whistle, and other things with which

my shooting coat pockets were generally burthened. In return they got me several shells from the reef, but begged all my cigars as payment for them. When I got up to go away, just before sunset, and asked them to shew me the path leading across the island, they all pressed round me and begged me to stay, apparently by all the inducements they could think of. They said, "lola shippo," "lola shippo," ("no ship, no ship"); and pointing to the huts, laid their heads on their hands, as if I should sleep there, offered me cocoa-nuts and plantains, and at last pointed to a tall young woman, named "Keewai," of whom I had taken some notice, as if to say she should be my companion if I would remain with them. I laughed them off, however, and pointing to the sun setting, said, "shippo, shippo," and moved on, not without some apprehension that all this seeming good will, might be the prelude to some act of violence, in order to obtain possession of the treasures I had exhibited. Nothing of the kind seemed intended, however, for in seeing me determined to go they yielded at once, and sent a young man with me to put me on my right track, through the thicket at the back of the huts, on to the path in the grassy valley.

Just before reaching Beeka, I met Duppa and his party, returning home, apparently highly delighted with their visit on board the ship. All the girls were ornamented with bead necklaces and other presents, and were now quite friendly and

familiar, running up at once instead of keeping in the back ground, as if at last assured of our good intentions.

Mammoos would go on board with me, taking a large tortoise-shell figure of a boy, three feet high,

and very curiously constructed, for which I had no room, but which he sold to Mr. Bell for an axe.*

* It is now in the Museum of the United Service Institution.

He had not brought me the "barreet," but he promised to do so in the morning, on my offering him one sapara (axe), one nipa (knife), one wallee (cloth), one tarpoor (bottle). It never came, however, and they seemed strangely unwilling to part with it.

Their numbers do not go beyond two, reckoning thus,

One	netat.
Two	naes, (or nace.)
Three	naesa-netat.
Four	naesa-naes.
Five	naesa-naesa-netat.
Six	naesa-naesa-naes.

Beyond six they never think of counting, three twos being not only six, but any indefinite large number. Mammoos inquired one day of Lieut. Risk, the number of all our large vessels, or "ow shippo," and small ones, or "kabbi shippo," as they called the boats. On Lieut. Risk enumerating them, he took little pieces of stick, and made a little bundle of four, for the Fly, Bramble, Prince George, and Midge, and of the requisite number of smaller pieces for the boats, amounting then, I believe, altogether to eleven.

CHAPTER VIII.

THE MURRAY ISLANDS—FRIENDLINESS OF THE PEOPLE—PURCHASE OF SKULLS—SEARCH AFTER A "BARREET"—GEOLOGICAL STRUCTURE OF THE MURRAY ISLANDS, ERROOB AND CAEDHA—VOLCANIC ORIGIN—SECOND VISIT TO ERROOB—WAY OF USING THE BOW—DOOPEGAB'S SISTERS—NEW GUINEA CALLED DOWDEE BY THE ERROOBIANS—NAMES OF PLACES IN DOWDEE—ANCHOR OFF BRISTOW ISLAND ON THE SOUTH COAST OF NEW GUINEA—LOW MUDDY SHORE—CANOES—MOUTH OF A LARGE RIVER—A BODY OF FIVE HUNDRED NATIVES SEEN—TWO BOATS SENT AWAY—ANCHOR UNDER BRAMBLE KEY—RETURN TO NEW GUINEA COAST—SHIP'S CUTTER NEARLY SWAMPED—GALE OF WIND—ANXIETY FOR OUR BOATS—AIRD'S HILL.

On *April* the 9th, while between Anchor Key and the north end of Portlocks Reefs we saw a palm (apparently a sago-palm), floating on the water. It was upright, with its branches standing above water, so that it was at first taken for a canoe under sail. It probably came from the rivers on the coast of New Guinea, from which we were at this time full sixty miles distant.

April 11.—We anchored at ten this morning on the north-west side of the Murray Islands, about half a mile from the shore. I was much struck with the stratified appearance of the rock and the highly inclined position of its beds. The island is

lofty and broken, its highest point being 750 feet above the sea. This is a bare eminence, forming a narrow ridge, slightly concave towards the interior of the island, where is another and lower hill, of a conical form. From the outside of these the ground slopes steeply towards the sea, especially on the west and south sides. It is almost entirely covered with one thick grove of cocoa-nuts, spreading even over the tops of the lower hills in greater profusion than I ever saw elsewhere. Its size is rather greater than that of Erroob, its greater diameter being from three to four miles. Its native name is Maer.

On the south-west side of it are two much smaller islands connected together by a sand bank and coral reef, but with a deep channel between them and Maer. Their names are Dowar and Waier. Dowar is the largest, being 670 feet high, and very precipitous. Waier is probably not more than 300 feet high, formed of a circle of nearly perpendicular cliffs.

As soon as we had anchored, several canoes put off, but hesitated to come alongside till we shouted to them words of friendship and invitation, in the Erroob language, which is likewise theirs. At this they seemed highly delighted, and immediately came on board in great numbers, bringing tortoise-shell, bows and arrows, ketai, and cocoa-nuts, to barter for knives and axes.

On Melville shewing them the sketches he had made of several of the inhabitants of Erroob and

Masseed, they burst out into shouts of delight, crying out the name of the persons, and thus attesting in the most striking way the accuracy of the likenesses.

Old Duppa shortly came on board, the man who had behaved so kindly to Ireland and young D'Oyley, the survivors of the wrecked and murdered crew of the Charles Eaton.* He was the father of young Duppa of Erroob, and he brought off another younger son, whose name was Dzon, or Dzonna,† but who was also called "Kabbi Duppa," or "Little Duppa."

Old Duppa related to us a long history about Wak and Uass (the native designations of Ireland and D'Oyley); but all we could make out was, that when Dzon was so high (about four feet), Uass was a piccaninny, so high (about two feet).

I accompanied Captain Blackwood ashore in the afternoon, attended by an intelligent native called Koiyōp, who had attached himself to me. The people ashore received us with a clamour of delight, men, women, and children; the two latter, however, keeping a little in the background at first.

The whole shore here was lined with a continuous row of houses, each in a small court-yard of from ten to twenty yards square. The houses were the

* See the "account of Mr. Lewis's cruise in the Isabella, in search of the survivors of the Charles Eaton," in the Nautical Magazine for 1835.

† This was the same sound as that which they used for our English name John, and may be intended for that.

same as those of Erroob, as were also all the habits, customs, and appearance of the people. The population here, however, was greater, and the houses, perhaps, larger and more complete than at Erroob. They seemed very clean and neat inside, with raised platforms, covered with mats for bed-places; but as the only light came through the little low door, it was difficult to make out exactly what they contained. The tops of the houses, as also of the fences of the court-yard, were ornamented by large white shells, and occasionally a skull or two was suspended somewhere near the house, or placed on the stump of a tree and painted red. I did not observe any marks of violence on any of the skulls, and believe they are only those of their relations, though very likely the head of an enemy might also be preserved in the same way; the motive being in the first case affection or respect, in the second exultation or revenge. They did not appear, however, to attach any great value to these skulls, and freely parted with several of them for knives or tobacco. Here and there between the fences of the huts were left narrow passages, giving access to the land at the back, where there were some small plantain-grounds, and groves of cocoa-nuts, immediately behind which rose the steep sides of the hill, forming occasionally small cliffs, and exposing the rocks, which I shall presently describe.

They seemed quite pleased at our knowing a few words of their language, and as we walked along

the beach the seniors frequently invited us to shady spots behind the houses, where they asked us to sit down, and then formed a ring round us, seemingly bent on having a regular gossip. The younger part of the community seemed more intent upon frolic and amusement, and were especially delighted at seeing our dog Fly (a Scotch colley, with all the intelligence of her race) fetch and carry sticks. They were at first a little afraid of her, and she did not greatly admire them. I did not observe that they seemed surprised at her barking, which yet I never heard their own dogs do. They seemed very fond of a little mischief, and frequently one or two would bring us sticks, and point to a group of girls, making signs to throw the sticks over them, so that Fly might run among and frighten them. I have before remarked that the readiest way of making friends with these children of nature is by engaging in tricks of this sort, and amusing them by any kind of sport or buffoonery. In a very short time we were on the most familiar terms with them all, and the women and children crowded round us without fear.

Koiyop accompanied us on board again, and at sunset we had some difficulty in persuading him and others to leave us and go ashore for the night.

April 14.—The canoes were off early this morning, bringing some yams, plantains, and cocoa-nuts; but they seemed more ready to part with their bows,

arrows, and other implements than with their fruits and vegetables, of which they did not seem to have any great stock to spare.

Koiyop being down in the gun-room, I persuaded him to sell me his wig, which he told me was made of the hair of young Duppa of Erroob. He wore his own black hair short under his wig, which he seemed rather reluctant to part with, asking for a looking-glass, "perper," to see how he looked without it, and saying, "keimear naeg," "men laugh," as if he thought they would laugh at him without it.* For a good knife, however, he let me have it; but the next day I found him provided with another.

At eleven o'clock I accompanied Captain Blackwood in the Midge to visit Dowar and Waier. After passing one or two sunken patches of coral, we beat up in a clear deep passage between Maer and Dowar. At this end Maer slopes very steeply down from the summit of the ridge into the sea without any beach. Dowar is likewise very steep,† but has a small sandy flat at its northern end, on which were some huts in a grove of cocoa-nut trees, and several people awaiting our approach. We continued our course, however, for Waier, which is

* This wig is now in the British Museum.

† They called the peak both of Maer and Dowar "pasaer," as they did that of Erroob, so that it is probably their general name for a hill.

a circular island, bounded by steep cliffs, on the top of which was a line of broken crags, looking like a ruined wall surrounding a central hollow. On the north end of this also was a small sand-flat, from which a shoal bar stretched, dry at low water, and then connecting it with Dowar. On the sandy flat was one hut with a small plantation; and being obliged to anchor in consequence of squalls, and the tide setting against us, we pulled ashore in a little punt, and landed near it unarmed. Several people, chiefly women, crossed over from Dowar, and met us, and, with two or three old men and some boys, seemed delighted to see us. Near the hut on Waier was a small enclosure, surrounded by a bamboo railing, in which were some old cocoa-nut trees, and a great many young ones just sprouting. Shells were hung up all round the railing, and on an old stump in the centre was a skull, old and weather beaten, smeared with red streaks of paint, and with several red flowers arranged on some twigs before it. Festoons of ropes, ornamented with feathers, hung round it from the trees; and we thought, from the pains taken, some great value must be attached to it, yet they allowed us freely to handle and examine it, seeming rather amused at our curiosity, and eventually they even sold it to us for a stick of tobacco.

Captain Blackwood and I scrambled along some distance under the cliffs, but could find no point

where the interior of the island was accessible without considerable difficulty.

The manners of these people were very frank and gentle, full of fun and cheerfulness. They were great beggars for tobacco, as long as our stock lasted, but were soon satisfied when told it was all gone. On taking leave, they all pressed round to shake hands with us, and seemed to beg us to come again. In shaking hands they do not clasp as we do, but each gently scratches with the nails against the palm of the other's hand.

On returning on board at sunset I learnt that a very fine bare-tailed opossum or "barreet" had been seen ashore on Maer in a cage, which they seemed to prize very highly, taking it out occasionally and petting it, and allowing it to climb about them. Melville had taken a sketch of it.

April 15.—At daylight I went ashore in quest of the "barreet," taking with me a basket-full of articles I thought irresistible, consisting of an old sword furbished up, an axe, knives, bottles, variegated handkerchiefs, &c. Mr. Millery had left a note-book ashore, having let a man examine it, and forgotten to ask for it again. On inquiring for it this morning it was immediately brought to him, with a rude caricature of himself in one page, with a hat on, and a pipe in his mouth, sketched by one of themselves.

A shower of rain was falling as we landed, and they all immediately retired to the shelter of some

trees, shivering, and saying "zeru, zeru," "cold, cold." Koiyop joined me, and I inquired for the "barreet." They said it was gone to Dowar, but not believing them, I went on along the beach to ask some others. At last I produced my sword and other commodities from the basket, which Johns was carrying with me, and offered them for it. They seemed greatly to covet these things, but they still persisted the "barreet" was gone to Dowar. I perceived, however, each new comer was instructed by the others as he came up what story to tell me, so I went on. An old woman immediately started up and run before me, and thinking she was going to get the animal out of sight, we gave chase.

She beat us most shockingly in running along the deep sand of the beach, and turned a corner before we could overtake her. At length we came to the last house on the west side of the island, immediately beyond which the rocks plunged almost perpendicularly into the sea. This, I found, was old Duppa's residence; he having three very good huts within one fence, and an excellent plantain ground at the back, Here, before my followers could instruct them what to say, I was told the "barreet" was gone to Waier, to Miriam on the south side of the island, and three stories in one breath. They begged to be allowed to see all the things I was willing to give for it, and I had them all spread out on the sand. It was evidently a great temptation; and a

long discussion took place, which ended at last in their saying, they would bring the animal on board to-morrow morning, and let me have it for these things.

Notwithstanding we were only two of us, apparently unarmed, as Johns only had a pistol in his pocket, they saw all the treasures restored to the basket without thinking of intercepting them; and after a friendly farewell to Duppa and his family, we returned to the boat.

All the way along we were invited into the houses, and Koiyop insisted on our coming into his court-yard, where he gave us some cocoa-nut water.

I went on board, intending to return after breakfast and examine the interior of the island, but found preparations made for weighing; and at ten o'clock we left the Murray Islands, and did not again return to them.

I shall now give a brief account of the geological structure of these Murray Islands, and Erroob.

The stratified rocks, of which they are composed, may be briefly described as a volcanic sandstone and conglomerate. The sandstones were made of small rounded grains of lava, and of volcanic sand and ashes, with some calcareous grains and strings of carbonate of lime. The conglomerates exhibited, in a light-brown earthy matrix, fragments and blocks of black trachytic lava, from the size of a pin's head to that of a man's, mingled with which were

lumps of white limestone, often as large as the fist, heavy, hard, and crystalline. Strings of calcareous spar were also disseminated through the mass. The pieces, both of lava and limestone, were irregular in shape as well as size; but some of the lumps of limestone, as well as those of lava, appeared partially rounded by attrition. The proportions of the two materials varied in different beds, the limestone sometimes equalling the lava pebbles in quantity, sometimes the lumps of lava greatly predominating over all the other materials. From these rough conglomerates, the beds passed through every gradation into the finest possible tuff. They were all perfectly stratified, forming regular, hard, tough beds, one or two feet in thickness. Their colour varied from a dark yellowish brown, in the coarser parts, to a light stone or dove-colour in the more finely grained portions.

In the island of Maer these beds have a regularly quâquâversal dip from the centre of the island to the sea, on the north, west, and south sides of it. On the south-west side they were inclined at an angle of full 60° from the top of the island to its base. The upper ends of these beds form a curvilinear ridge, concave towards the interior of the island, where is another hill, of a conical form, the composition of which I was not able to ascertain.

Of the structure of Dowar I can only say that it is formed of beds of precisely the same appearance as those of Maer, that they are inclined at

great angles, and dip outwardly from the interior of the island, on its north and east side.

Waier is likewise composed of the same beds, but containing more conglomerate than those which I saw on Maer, and for one half its circumference, has a regular quâquâversal dip from its centre, but not at a greater angle than 10° or 15°.

In none of the Murray Islands did I see any traces of lava or igneous rock, except the fragments contained in the conglomerates; igneous rocks, however, may exist in mass in the interior of the islands, a fact which I greatly regretted that time did not allow me to ascertain.

In Erroob, on the contrary, the whole island is a mass of igneous rock, from the summit to the sea-shore, with the exception of a small portion of its N.W. side. Here, in the cliffs of Treacherous Bay, the stratified sandstone and conglomerates make their appearance from under the igneous rocks, dipping towards the interior of the island, or S.E. at a slight angle, not more than 5° or 6°. The igneous rock is a heavy, dark-coloured hornblendic trap, generally conpact, but here and there slightly cellular, or having a few dispersed crystals. On the N.E. side of Treacherous Bay, the cliffs shewed the igneous rock, resting on the sandstones, and it appeared to have flowed over them as lava. The sandstone was not apparently altered, but the igneous rock was much more cellular and cinder-like than usual for two or three feet above the sandstone,

when it gradually recovered its compact, amorphous character.

As previously mentioned, the summit of Erroob has a small hollow which might be taken for a nearly obliterated crater, but there is only the slight evidence of form in favour of such a supposition. Thirty miles north of Erroob, another patch of igneous rock shews itself in the centre of a small reef, called by us Bramble Key, but the native name of which is Caedha. This is a mass of rock twenty or thirty feet high, and about twenty yards across, in the centre of a coral reef, which has a sand key on one end of it. Another small patch of the same rock is seen three-quarters of a mile distant, to the S.E. dry only at low water. This rock has a singular appearance, being a dark red cellular lava, the cells of which are filled by a white earthy mineral in a pulverulent state.

It appears, then, that just at the northern end of the Great Barrier reefs, volcanic vents have burst their way through them at three separate points, ground up the limestone rocks they met in their passage, and ejected a quantity of molten matter into and through them. But there is evidence of this having happened, not once only, but probably through a long interval of time. The sandstone and conglomerates, containing pebbles of lava and limestone, must have been formed horizontally beneath the sea. This is evident from their laminated and stratified character, from the perfect sifting and

sorting the materials have undergone, and from their being strewed in narrow lines and sheets over large spaces, with the same thickness in all its parts. It is evident that if the pebbles of lava of which some of the beds are composed, had been deposited on a slope of any thing like the angle they now have, either in air or under water, they must, many of them, have rolled down and accumulated at its foot, and the bed formed of them have been much thicker there than elsewhere. Since the deposition of these beds, therefore, they have been elevated above the sea from 300 to 700 feet, and in some places tilted up into an angle of 60°; and in the island of Erroob they have been covered up by a thickness of 400 or 500 feet of igneous rock, sometime after their deposition, and either previously or subsequently to their elevation above the sea. I did not succeed in finding any organic remains to give a relative date to the formation of these rocks, but the pieces of limestone look exactly like the masses of limestone now forming in the coral reefs, just so much altered by heat as we might expect from the circumstances they would be. I believe that, geologically speaking, these volcanic islands are of recent origin. They are evidently an offset of that great belt of volcanic operations, part of which ranges at no great distance to the northward and eastward, along the north coast of New Guinea, into the Solomon Islands, New Hebrides, and New Zealand.

On *April* 19*th* we again anchored at Erroob, on

our way to the coast of New Guinea. As it rained heavily, I went into one of the larger huts, which had a fire in the middle. There were good bed places, covered with mats, raised about a foot and a half from the ground, and large bundles of mats, bows, arrows, axes, fishing-spears, pipes, and calabashes, hanging over head. As there was no opening, except the small door, the smoke oozed through the thatch, and it felt to me intolerably hot and close.

In using the bow, they explained to us that they always held a particular end upwards, that which is uppermost, namely, in the living plant, but could give no reason for the custom. Beside the bow and arrow, their principal weapon is a club, called gaba-goob; this is a round, flat piece of stone, bevelled to an edge like a quoit, but with a small hole in the centre, into which a wooden handle is inserted. It thus becomes a most murderous weapon, but we only saw one or two of them.

I inquired for the "barreet" (which I found was a species of opossum, belonging to a subgenus called cuscus, peculiar to New Guinea), and was told Dzoom had one; and I sent him a message by a man called Jessè, to say I would give him a sword and an axe for it. I inquired for Doodegab, and was told he was on the other side the island; but two good-looking girls, called Derree and Atai, were pointed out as his sisters; and they told me, since I had changed names with Doodegab, they were now

my sisters, saying, "Derree berbet* Dukees, Atai berbet Dukees." As the rain had now ceased, they got up to accompany us back to the boat, and I taught them to walk arm-in-arm with me, at which they seemed much amused. Two others immediately came up and took Dr. Muirhead's arms, which elicited a roar of laughter from the rest. They seemed to enjoy the joke, and proposed we should race one party against the other; but Dr. M. and I soon found that running over the deep sand and rough beach was to us no joke at all, although perfectly easy to our lightly clothed and active partners.

On arriving at the boat, I proposed, in order to see what they would say, that they should go off to the ship, and be our "coskeer" (wives); but at this they drew back and seemed rather alarmed, saying,† "Lola coskeer,—berbet,—coskeer lola!" On seeing it was merely a joke, however, they laughed, as a girl would in England at a similar proposal from a stranger, and took a friendly leave of us.

April 21.—There were many natives down at the watering place to-day, as we told them we were going away and not coming back. I inquired about places to the northward: they seemed to have no acquaintance with any such names as Papua or Arafoora,

* Berbet means sister certainly, and I believe brother also, from the way they use it.

† "No wife,—sister,—wife not."

but frequently mentioned Dowdee, saying it was "ow gaed" (a large country); "Erroob kabbi gaed" (holding their hands a few inches apart); "Dowdee ow gaed" (opening their arms to the full extent). They also said that in Dowdee there was "barreet, barreet, barreet" (a plenty of barreets). In this Dowdee they gave me the following list of names of places apparently in the order of their occurrence: Samărree, Dodee, Keewai, Eemăree, Parrem, Baeb, Kerĕged, Erro, Mowat, Saibar, Dowar (distinguishing it from the Murray Island Dowar by saying "Dowar Dowdee," and pointing to the north, then pointing south, and saying "Dowar nerroot," another Dowar), Oigé, Katătai, Sowee, Kagga, Coer, Baigoo; all these, they said, were in Dowdee, expressing it Samarree Dowdee, Keewai Dowdee, &c. In order to try them, I went over the names, and inserted Merad, the neighbouring sand bank, amongst them, on which there was an immediate shout of "Lola! lola! Merad meik, Dowdee mazepkor," or "No, no! Merad is near—Dowdee far off." I have, therefore, no doubt that they are acquainted with a very considerable extent of that part of the south coast of New Guinea which lies immediately north of them, and that their general name for the country is Dowdee.

When the men went off to their dinner at noon, I was left ashore alone with the natives. They sat down in groups under the shade of the cocoa-nut trees, eating their roots and shell-fish. In order to

try them, I walked deliberately from one group to the other; but none of them offered me anything, except Seewai, who held up to me half of a large ketai and a young cocoa-nut, so I sat down and lunched with him and his wife and daughter. These yams, when cooked by native women in the ashes, were excellent. Old Seewai seemed by far the most honest and kind-hearted fellow among them, as also were the old lady, his wife, and Passălag, his daughter, among the women. They had been rather overlooked by us lately from their modesty and want of forwardness. They never begged anything from us, which almost all the rest were continually doing. Old Mammoos especially seemed a regular schemer, having always an eye to his advantage, and to increasing his importance to us, and always taking good care to be paid one way or other for his services. He was perhaps the shrewdest and most intelligent among them, with the most force of character, though by no means of the most open or best disposition.

On the 25th, we anchored off the edge of the great reef that stretches south from the coast of New Guinea to Warrior Island, the eastern outline of which had been surveyed by the Bramble. We here at length came in sight of the coast of New Guinea, and attempted in the afternoon to land upon Bristow Island. It was found, however, to be a mere bed of mangroves, growing on a mud flat, which was entirely afloat at high water, and even then so shoal around, as hardly to be accessible to a boat.

On the 26th and 27th, we were beating to windward, in order to weather the shoals and mud-flats that extended from the coast towards the east. The land was everywhere low and flat, covered with trees, but seemed hereabouts to be fronted by a sand beach at some places. We could make out something like houses occasionally at the edge of the woods, and saw fires on shore at night.

April 28.—We anchored last night in five fathoms water, muddy bottom, and remained there some time this morning, waiting for the Prince George and the Midge to come up. The coast was quite flat, with a great line of cocoa-nuts and other palms running along the beach, which appeared to be sandy. Several large openings or gaps in the shore were remarked, up the widest of which no land could be seen from the mast-head. The water was so shoal inshore of us, that we were compelled to keep at a distance of eight or ten miles from the land. Canoes were reported inshore, and three of them came out towards us. These canoes were rather small, and had an outrigger on one side only, differing in this respect from those of the islands of Torres Strait. One of the canoes had sixteen men in it, another six, and another four. They approached us very cautiously, and only one came within hail. We then tried them with Erroob words, such as "poud" (peace), "boonarree" (cocoa-nuts), "tooree" (iron), which they appeared to understand. They held up cocoa-nuts, and I believe mentioned

Erroob. They resembled the people of Erroob a good deal, and I think had the same mark on the shoulder; but one or two of them had their heads shaved, which I never saw among men in the islands. One of our men being alongside in the Midge's dingy, was sent to communicate with them. He got alongside the largest canoe, and gave them a hatchet, for which he got a bow and arrow, some cocoa-nuts, and a small turtle, but he began to behave rather roughly towards them, and they became alarmed, and paddled off. In approaching, they held up green boughs, and seemed, in most respects, to resemble the Erroobians. They were all quite naked. On the south-west coast of New Guinea also, I believe, the natives have ragged, torn ears, and pierced noses, like those of Erroob and Murray Islands. This afternoon, on getting under weigh to proceed to the northward, we came on to a great mud bank, with a depth of only three fathoms on it, at a distance of six and even eight miles from the land. When immediately opposite the great opening seen this morning we found the water alongside the ship, during the ebb tide, very muddy, and on dipping some up and tasting it, it was found to be only slightly brackish, just enough to be unpleasant to drink. This was at a distance of ten miles from the shore, and confirmed us in our opinion of the opening being the mouth of a large river.

April 29.—Captain Blackwood and Lieut. Ince went away in the first gig to examine this river,

but I did not feel well enough to accompany them.

April 30.—The wind was very light to-day, and the tides ran so strongly in and out of the river that the ship was not able to stem them, and obliged twice to come to an anchor while sounding about the edge of the bank.

May 1.—The Captain returned with the first gig. They had gone first for the south point of the opening, carrying depths varying from one to three fathoms, and landed in the evening near some deserted huts, at which they slept. These huts were raised on posts, with gable ends, like the houses of the Malays. Abundance of cocoa-nuts were growing near them. Next morning they stood across the mouth of the river to its northern shore. It was about five miles wide, with a depth of nearly four fathoms for great part of the way, and the water so fresh as to be quite drinkable. They saw no inhabitants till they approached the north shore, when, just as they were going to land, a great body of people rushed out of the woods towards them. Captain Blackwood estimated the number of men as fully five hundred. Not wishing to shed blood unnecessarily, and not having force enough to overawe so large a body of men, Captain Blackwood decided on returning. As soon as he put the boat's head round, and made sail for the open sea, they ran down to their canoes, and manned four of them, and gave chase, pursuing our boat with great eagerness

for several miles, and for some time with every appearance of eventually overtaking her. They could count about forty men in each of these canoes. After a hard pull, they succeeded in shaking off their pursuers, and got on board the Prince George in the middle of the night.

May 2.—Running to the northward, in six fathoms, out of sight of land, with shoals immediately inside of us. As it seemed quite impossible for the ship, or even for the Prince George, to get sufficiently near the coast to survey it, it was found necessary to send away the boats to trace its outline, while we ran along in the ship on the edge of the shoal bank. The Midge, accordingly, under Mr. Pym, and Mr. Harvey in the second gig, with whom Mr. Millery went as a volunteer, were sent on this service. The Midge had six and the second gig five days' provisions on board, and they were altogether twelve men and three officers well armed, and the Midge had a small boat-gun fitted on her forecastle. The Prince George was directed to keep as closely in as the depth of water would allow, in order to be within signal distance both of the boats and the Fly. The weather was now very fine, so that no difficulty was anticipated in keeping up a communication.

On *May* 3rd we were running to the northward and eastward in four fathoms muddy water, and sandy bottom, with no land in sight from the deck, but a line of trees visible from the masthead. A little before noon the tide turned against

us, and, as the wind was light, we anchored. About half an hour after the ebb tide began to run, we observed a strong ripple advancing towards us from the shore at a great rate, with a curved but well defined outline or edge. It was formed by a strong current of very muddy water, apparently river water, running out over the green water of the sea. On approaching the coast of New Guinea, the sea quite loses the deep and transparent blue it preserves among the islands and coral reefs of the Great Barrier, and acquires a dirty green colour, like that of the sea in the English Channel. This river water, however, was of a brown mud colour.

May 4.—The wind freshened a little to-day, and on standing to the northward, we came in sight of two low mangrove points, projecting from the coast, and apparently forming islands. Outside these we saw the boats under sail, and also the Prince George, all standing towards the north. The water was as shoal as usual.

May 5.—It began to blow more freshly, and in standing N.E. we got on to a bank of three fathoms, and were obliged to tack and beat to windward, in order to weather it. Squalls of wind and rain, with dirty weather, came up in the afternoon, and as these shoals were dead to leeward of us, it was thought prudent to beat up to gain something of an offing, and we anchored at night in seven fathoms, with a short, nasty sea breaking round us.

May 6.—Blowing fresh, with rather dirty weather, making it imprudent to run in for the shoal water, so we stood to the southward, and anchored at noon under Bramble Key, in order to get sights for the chronometers. I have already mentioned the volcanic rocks which jut up in the middle of this reef. The reef itself is almost entirely composed, as to its surface, of one coral, pocillopora cœrulæa, of a greyish colour outside, but a beautiful blue when broken open. It occurred in large, flat, stool-like masses, with indented edges, often as much as one or two yards in diameter. I never saw it elsewhere, except as small detached blocks of coral, in the hollows and holes of a reef. The sand-key on one side of the reef was precisely similar in appearance and structure to Raine's Islet, except that it was much smaller. It equally abounded with "spinach" and bird's eggs, and any ship coming in from the Pacific in want of fresh provisions might get enough for some days' consumption by stopping there, taking care to break all the eggs on the island as soon as they arrive, in order to have new-laid ones to carry away with them.

It will be seen, on reference to the map, that Bramble Key is a solitary reef, much nearer advanced than any other to the part of the New Guinea coast where all the mud and fresh water had been met with by us. I do not believe that it could have existed at all as an independent reef, but that it must be looked on merely as a

fringing reef round the central nucleus of volcanic rock.*

May 7.—After morning sights had been obtained for the chronometer, we weighed and stood to the northward. We passed suddenly from greenish blue water of about twenty fathoms depth, into a line of muddy water fifteen miles from the nearest point of land, soon after which we found ourselves in four fathoms mud, when we hauled out a little and anchored for the night.

May 8.—Captain Blackwood, Lieut. Ince, and Mr. Macgillivray, went away in the ship's cutter to examine the land, but as it was blowing fresh there was a very heavy rolling sea over these shoal mud-flats; and when they had gone six or eight miles, a sea broke into them and filled the cutter to the thwarts. They were obliged to throw their bow-gun and much gear and stores overboard, and with some difficulty baled the water out and reached the Prince George at night, as she was coming down to join us from the northward. She had had a view of one of the boats the day before, but lost sight of them again somewhere to the northward.

May 9.—This was a very stormy morning;—rain, wind, thunder and lightning, with a heavy

* The coral reefs marked in the old charts, as running along the south coast of New Guinea, west of Bristow Island, make it improbable that any rivers open in that direction, and render it likely, that these fresh water openings of ours are the result of the drainage of a large part of the country.

sea, made us rather anxious for the safety of our boats. As soon as it cleared off sufficiently to see around us, we stood to the northward, and in the afternoon saw a hill, named by Captain Blackwood Aird's Hill, bearing from us about N.N.E., and the flat land between us and it apparently turning round and stretching to the eastward. We anchored a little south of the latitude of 8°, with Aird's Hill bearing about N. by E. from us, in a depth varying from about three to four fathoms, according to the state of the tide.

CHAPTER IX.

SEARCH AFTER THE MISSING BOATS—CRUISE IN THE FIRST GIG—ENTER A RIVER—INTERVIEW WITH NATIVES AT ITS MOUTH—PENETRATE FIFTEEN MILES INTO THE COUNTRY—MEET A LARGER TRIBE, AND SEE A LARGE NATIVE HOUSE—RETURN—SHOOT A "CUSCUS"—HEAVY ROLLERS ON THE SAND-BANKS OFF THE MOUTH OF THE OPENING—RETURN TO THE SHIP—NO NEWS OF THE BOATS—FARTHER SEARCH FOR THEM.

May 10.—HAVING got no news of our boats, and the coast making a remarkable bend here, so that we did not know which way they might have gone, it was determined that the ship should remain here at anchor, with her royals loose during the day-time, while the other boats and the Prince George went in search of the missing ones. Mr. Pollard was accordingly despatched in the cutter, with directions to go along the coast, in shore, to the southward, and the first gig was prepared for Captain Blackwood and myself, to cruise to the northward.

May 11.—We left the ship at seven this morning, with a fresh breeze, a cloudy sky, and a heavy sea rolling in; the low land, both to the west and north of us made in broken lines and headlands of wood. We steered N. by E. for a bluff-looking point, the summit of which seemed to be 100 feet above the sea: nearly directly over it was Aird's Hill. As

we neared this point the sea became smoother, and after passing it, which we did about ten o'clock, we saw heavy breakers on the horizon to windward. We carried three fathoms water all the way round the point, but it is no doubt shoaler to windward, where the sea breaks. In approaching the point, we found that what we had at first taken for moderately high land, was in fact a wood of very lofty trees, growing on a dead flat scarcely above high water mark. These appeared to be a very tall, thin, straight species of mangrove. They grew perfectly upright, with slender pole-like stems, many of them full 100 feet in height, but, from their leaves, and the naked matted roots sprawling over the mud, they certainly appeared to be mangroves. Inside the point was a straight beach, running due north for about five miles, fronted by a low bank of black sand, on which we saw several natives running. At the end of this a deep bight opened to the N.W. and a creek ran up inside the sand bank, cutting it off from the jungle and wood of the main land. On the point of the sand bank twelve or fourteen men stood at the edge of the water, armed with bows and arrows; while a small canoe, with six or eight people in it, probably women, was paddling across the creek to the jungle. After pausing to look about us, we pulled for the sand spit; and as soon as we were near enough for them to see our white faces, the natives retreated rapidly towards their canoe, which

returned for them, and partly in her, partly swimming, they gained the woods. Here they halted while we landed on the sand spit, and four men paddled the canoe out of the creek, keeping close over to their side, and with every mark of trepidation in their countenances. One or two still remained on the other side, whom we endeavoured by every means in our power to entice over. We called to them in Erroobian words, which they did not seem to understand, and they shouted words back, which were equally incomprehensible to us. Captain Blackwood told one of our men to wade into the water, to see if one of them would meet him half-way. Arrived at the edge of the water, our man very naturally stripped off his shirt; but as soon as they saw that not only his face, but his whole body, was white, they seemed struck with horror, and after a ghastly stare, fled into the bush.

We took advantage of this strip of sand to cook our dinners, while Captain Blackwood was endeavouring to get the sun's meridian altitude: for this, however, it turned out too cloudy. In the meantime I succeeded in adding a teal and a thick-kneed plover to our stock of provisions, out of a flock of birds on the beach.

On our departure we saw another canoe coming toward us from the westward, and seeing us go away without doing them any injury, six or eight of the first party likewise put off in their canoe, and came towards us. We succeeded in inducing them

to come within about ten yards of us, but no nearer, and they stood looking over each other's shoulders, with staring faces, expressive not so much of astonishment as of downright horror; as if we were something inexpressibly fearful and disgusting to behold. They were tall muscular fellows, with white nose ornaments, a round piece of shell hanging on their breast, and a shield-shaped piece over the groin, armlets, and a waist-belt of string adorned with shells or tassels; their hair was tied back behind the head, and they had a very wild and ferocious aspect. They did not very much resemble the Erroobians except in their ornaments, and they did not seem acquainted with our Erroobian words.* As we could not get them to communicate more closely with us we made sail on a wind to the north-east. Due east of us, about ten miles off, was another long strip of land, ending in a point, from which land stretched all round the northern half of the horizon, covered with tall trees, but broken by many broad bights or openings stretching into it in various directions. For one of these, about five miles distant, we were now steering, and carried four or five fathoms water for three or four miles, but it then became shoaler, and we soon came on

* This part of the coast is full 120 miles north of Erroob, dead to leeward, in a bight, in which the sea must always be heavy. I think it probable the Erroobians would not venture so far down the coast in their canoes, and that their knowledge is confined to the parts adjacent to Bristow Island.

the edge of a large sand-bank and mud-flat, stretching between us and the opening. On the windward point of this sand-spit were heavy breakers. As it would have been difficult to weather those before dark, we determined to bear away for the next opening, which was now about two miles to leeward or north-west of us. Into this we carried four fathoms water, and soon after entering found ourselves in a very snug bight, sheltered from the wind, and with smooth water. Here we anchored, in order to eat the dinner we had cooked at the sandy point. We took up a berth about 200 yards from the shore, in case of accidents, and directly after we came to, a native shewed himself at the point, armed with bow and arrows, and was shortly joined by another. They stood looking at us for some time, till the first one raised his bow and let fly an arrow at us, which dropped just ahead of the boat. "Freathy," said Captain Blackwood to the coxswain, "take my rifle; don't hit that fellow, mind, but just fire a ball into that bunch of bush over his head." They took no notice of the flash or smoke, but an instant afterwards bobbed their heads, as if they heard the ball ringing over them, and immediately bolted into the bush. The water, although still four fathoms deep, and within view of the open sea, was only very slightly brackish, quite as pleasant to the taste as much of the water drank in the interior of Australia.

After having dined, we proceeded up this bight,

keeping the east shore on board, and presently saw three arms going off from it, one north-west, another north, and another north-east, towards the latter of which we proceeded. On the land, in the north-west direction, we saw several native huts, low and small, and apparently mere temporary accommodations, as they were now evidently deserted. We landed for a short time on the shore near us, which was bare mud, partly dried, resting on stiff blue clay, and hardly above high water mark. The lofty mangroves, or whatever they were, grew all over it, with here and there clusters of palms of different kinds, and of many other tropical plants, one of which was something like an aloe or agave, with broad succulent pointed leaves rising from the root, and armed with sharp thorns along their edges. The roots of the mangroves and the denseness of the undergrowth rendered the woods perfectly impermeable even to the sight for more than a few yards. They were thick, dank jungles, based on mud and dripping with moisture.

Our north-east arm presently again divided into two, one curving towards the north, and the other running straight and narrow towards the east. As it was now sunset, we chose the broadest part in which to spend the night, and anchored where the water, now quite fresh, was about a third of a mile broad, and nearly three fathoms deep.

Immediately after sunset, immense flights of parroquets passed over us, all flying to the west, at a

great height above the tops of the trees. During the night we heard the howlings of wild dogs, and many strange noises in the jungle around us, a combination of croakings, quackings, and gruntings, proceeding, probably, from large birds and wild pigs. We of course kept a sentry on duty, but the night passed away without any accident or interruption.

May 12.—This morning broke dark and lowering, with heavy rain, and though these deep woods and sluggish streams lay still and undisturbed, we could see the clouds drifting rapidly over head, shewing it was blowing strongly outside. As soon as we had breakfasted and the rain had cleared off a little, we proceeded along the channel leading to the east, expecting to gain the arm from the mouth of which we were repelled by the sand bank yesterday evening. Accordingly, in about half a mile, we came out on to a fine-looking deep stream, three-quarters of a mile wide, coming from the north. We immediately hoisted sail, and went up it, but had not gone half a mile before we came on some native huts on the bank at our left hand. Seeing no signs of inhabitants or smoke of fires, we landed to examine them. There were five or six huts, two of which were small and only just finished, but one was much larger and older. This house was quadrangular, with a gable-shaped roof, its ground plan being about twenty feet long by twelve in width. It was raised on stout posts, full five feet from the

ground, and the upper part was accessible by a notched post leaning against it at the back. The floor of this upper story consisted of stout poles laid crossways on the frame-work, and covered by the flattened rind apparently of some kind of palm, forming very fair planks, an inch thick, and the size of our flooring planks. The back of the house, looking towards the woods, was quite open, the other three sides had walls composed of palm-leaves twisted through upright poles or rods. The roof was thatched also with palm-leaves,* very ingeniously woven or twisted through a frame-work of sticks; it was quite water-tight. The ridge of the gable was about ten feet above the floor, and the side walls about four feet high. The end looking on the river had at one side a small recess, or doorway, with a rude little staircase leading to the ground. There were one or two fire-places made of a patch of clay, two or three inches thick, resting on the floor, over each of which was a frame of slender sticks, two feet high, as if to hang things over the fire.

A partial clearing had been made round the huts, many large trees having been felled by repeated cuts that seemed almost too sharp and broad to be those of a stone axe. Several young cocoa-nuts and plantains were growing in this clearing, and it looked exactly like the commencement of a new settlement by some New Guinea squatters. Dry fire-

* We afterwards found this was the sago-palm.

wood was stored in the houses, from which we took the liberty to help ourselves, as the rain still continued; and I picked up the jaw of a cuscus, that of a pig, and some shells belonging to the genera auricula and cyrena.

From the huts the river ran first north and then north-west for two or three miles, when it divided into two large branches. Of these we took one leading to the north-east, which made a great bend to the east, and then again divided, one part running east and south-east, and another due north, along which we proceeded. Here we caught a glimpse of Aird's Hill over the intermediate woods, bearing north by east, distant apparently six or eight miles. All these branches of water were from a quarter to three-quarters of a mile in width, all perfectly fresh, generally twelve to fifteen feet deep, with banks of clay and mud, covered with dense jungle, in which, as we proceeded, the mangroves became fewer, the palms more abundant, especially that which we afterwards found was the sago-palm, and lofty forest trees began to shew their spreading heads in the interior of the woods. In addition to the many branching arms of water, little narrow winding creeks and canals struck off into the jungle here and there in every direction, full of soft mud at low tide, increasing the difficulty of traversing the jungle on foot, but affording admirable places of concealment for the narrow canoes of the natives.

The rain still continued so far, but about noon it gradually cleared off, and in the afternoon it became fine. We proceeded up these winding arms and branches of fresh water, always choosing that which seemed to run most nearly north, till about three or four o'clock in the afternoon, when we began to think of returning, as we were only victualled for three days, and had been a day and a half away; Captain Blackwood, also, was anxious about the position of the ship and the missing boats. We were now in an expanse of water, from which several arms went in every direction, the two broadest running, one north and the other south. The view northward was very tempting; the land seemed to rise a little higher in that direction, and we saw distant trees in the north-west, which must certainly have stood on more elevated ground. What seemed to be a main branch of the river, stretched with a width of full half a mile to the north, till it became lost to sight among the most magnificent woods; and I stood regretting the necessity of leaving it unexplored, when one of the men called our attention to something moving in the water. Looking more attentively, we saw, in a narrow channel, about half a mile off, two or three canoes paddling about, the people having evidently caught sight of us before we espied them. We immediately pulled towards them, and on entering the channel others seemed to emerge, as if by magic, out of the bushes at its side; and a line of six or eight now crossed our path,

containing thirty or forty men, evidently determined to dispute our passage. When we came within about 150 yards of them, we lay on our oars. They were all shouting and gesticulating, flourishing their paddles and splashing up water into the air towards us, while we observed several adjusting their bows and casting loose their bundles of arrows. There was then a regular war-cry, a measured beat against the sides of the canoes with their paddles, and the two ends of the line advanced towards us. Captain Blackwood accordingly ordered the muskets to be got out, giving orders, if it were necessary to fire, to aim at first principally at the canoes, so as to give them some notion what our weapons were capable of, and, if possible, frighten them off without bloodshed. When within about sixty yards, two arrows were shot, as if to prove the distance, one of which flew over us, but the other dropped short. Captain Blackwood raised his rifle and put a bullet into a canoe very near the feet of two of the most forward, and they leant down and looked over, as if wondering what it could possibly be, when, at the sound of several muskets and the whistling of the balls, they jumped overboard, and swam for the woods. The other canoes took to flight up the channel, two or three more balls being sent skimming along the water alongside of them, to shew they were still within our reach. None of the men were struck, but the deep and lofty woods on each side of us lent an echo to the rattling of the musketry, that produced

a great effect, and must have considerably appalled them. As we were here within arrow-flight of the banks of this narrow channel, we followed the canoes for about a quarter of a mile into the main stream again, when we observed them landing on the opposite bank, among a crowd of natives. These stood half concealed among the bushes, at the mouth of a small creek, and behind them was a most singular looking house, which immediately attracted our attention. When arrived within about a third of a mile of it, we examined it with our glasses, and were greatly surprised at its size and structure. It looked just like an immense barn, one gable of which projected towards the river, but the roof stretched so far back as to leave the other end completely hidden in the woods. Under the projecting gable was a sort of stage or balcony, on which were several people, standing and gazing at us.

This was evidently some height above the ground, as they were completely exposed to view over the tops of the bushes. The roof was covered by a very thick heavy-looking thatch, along which smoke was oozing at various places. From the balcony, one or two arched door-ways led into the interior, through a wall apparently of bamboo, that was several feet back under the roof, which projected into a peak over the balcony. The end of the house that was visible was far larger than any barn I ever saw.

The canoes were now re-manned, and pushed off towards us with about fifty men in them. While

we were reconnoitering these with our glasses, one of the men said he saw the people puffing smoke at us from the balcony, that they waved their arms, and a jet of smoke proceeded from them "like the puff of a pipe." I did not succeed in seeing this action myself, but I have no doubt it was the same as that observed by Cook when he landed on this coast to the westward, and which has never yet been explained or accounted for. The men seemed each ornamented with a piece of round shell hanging on their breasts, and most had the shield-shaped piece of shell over the groin. They were generally of a dark brown or copper colour; but we observed one lad of a pale dirty yellow, the colour of a frog. The canoes were quite simple, having no outrigger on either side, but appearing to be a mere hollow tree. The paddles were about five feet long in the handle, with a diamond shaped blade, the men using them as they stood up. They gradually advanced towards us, and one man seemed inclined to come up alone in a small canoe. We tried him with Erroob words, but he did not seem to understand them, and replied in words unintelligible to us. As we were now so far from the sea, with such a labyrinth of channels to trace back, it would evidently never do to proceed with so strong a body of enemies likewise in the rear. We determined then to return at once, and not attempt further communication with these people, as it would only lead probably to bloodshed, without any adequate reason. I should

have much liked to examine the house, but we were too few to overawe them without coming to positive hostilities; so we took to our oars, and went rapidly down the river with a current in our favour, apparently due to the ebb tide. They followed us in their canoes for a little distance, and we passed another small hut, from which a man ran out with his bow and arrows, and gazed on us as we went by. Here they halted, and as it was now near sunset, we proceeded with all haste in order to get a secure place at some distance in which to anchor for the night. Having proceeded about four miles, we reached the straight broad reach running nearly north and south, from which we got a glimpse of Aird's Hill in the morning. About the middle of this we anchored. All night long we heard similar noises in the woods and jungles around us to those we had heard last night.

May 13.—We determined to discover if possible what these sounds proceeded from, so just at dawning pushed the boat into one of the small lateral canals leading into the jungle. We were soon obliged to lay in our oars, and either pole along or draw the boat on by grasping the over-hanging boughs, and found ourselves in a small muddy channel, environed by a great wood of very tall trees. In one of the dark recesses a cuscus was seen on a branch of a tree, but I strained my eyes in vain to discern it, till one of the men put some shot into his musket over the ball, and knocked it

into the water. It was dreadfully torn, and every bone broken, but I succeeded in skinning and preserving it, and the skin is now in the British Museum. The ground was tolerably dry and firm, and Captain Blackwood proceeded a short distance into the wood, while I stood in the boat where there was more light, to try to get a shot at any bird or animal that might come across. Captain Blackwood found the footsteps of pigs everywhere very abundant, but he could not penetrate far, for the great prickly succulent plants and matted creepers. Many pigeons, parrots, and white cockatoos were flying about, but they all kept so high about the very tops of the trees that though I fired several times I did not bring any down. We then returned to the main stream, and pulling into the middle, let the boat drift slowly down with the stream, while we were eating our breakfast. We then pulled down some distance farther, looking for a spot to land, on which there should be a sufficiently clear space for the artificial horizon to receive the sun's rays at noon, in order that Captain Blackwood might determine the latitude. We at length found a part of the bank with a sufficient margin between the river and the wood for that purpose; a patch of mud covered with green herbage about a yard across, and here accordingly we waited till noon. I occupied the time in skinning the cuscus, the flesh of which we had for dinner, and Captain Blackwood shot a very fine pigeon and another bird, both of which are now in the British

Museum. We found ourselves in S. lat. 7° 35′, and supposed the village we had seen to be five miles farther north, in a straight line. We were now about ten miles in a direct line from the low point for which we steered when leaving the ship, so that we had penetrated about fifteen miles into the country. During the afternoon we pulled down to the first group of huts we had met, and then beat out to the mouth of the opening. The channel here was a mile or a mile and a half wide, the water slightly brackish. Several channels, equally wide, and seemingly equally deep, ran as far as we could see towards the east and north-east, cutting up the land into numerous islets, and apparently communicating again with the sea towards the east.

We anchored for the night with the open sea in view, but sheltered by a long low island of jungle on our left, and on our right by the long sand-bank that had impeded our entrance into this channel as we approached it from the sea.

May 14.—A dark rainy morning. We pulled out to the southward, keeping pretty close to the shore on our left, where we had plenty of water. Just at the point of this shore we found an old hut or two, which we took possession of in order to cook our breakfast, as it rained heavily.

About nine o'clock it cleared off a little, and we pulled out to the southward for about three miles, leaving the extremity of the shoal point about half a mile on our right hand, and having a long line of

mangrove coast stretching away to the south-east on our left.

We had a depth of about three fathoms, and having got out into the breeze we made sail close on a wind, hoping to fetch the ship, which was now about seventeen miles distant. We had not gone more than a mile or two, however, before breakers and shoal water were seen ahead, so we "doused" the sail, and pulled to windward, hoping to get round them. As we were now unsheltered by any land to windward, the sea was very heavy and rather confused, the whole swell of the ocean pouring right in upon these mud flats. Having pulled to windward of the chief mass of breakers we again set sail, and stood to the south-west, keeping the oars likewise going. In this way we continued pulling and sailing for several hours in a general depth of about three fathoms, making but slow way, and obliged to keep a watchful eye on the sea. Heavy breakers occasionally rose on all sides of us, often not breaking in the same place twice together, but just wherever a higher swell than usual happened to meet or be incorporated with another. A line of huge rollers occasionally swept past us, and once three great waves in quick succession. These were of great height and regularity, and as when the first approached us, we had good way on the boat, her head was quickly brought to it, and she rose over it in good style, and then fell in the succeeding hollow. Here was the point of danger, the height

of the next roller completely becalmed our sails, and had we not had the oars out to give the boat steerage way, and keep her head in the right direction, the sea would probably have taken us broadside on and engulphed us.* As it was we again mounted on to the back of this huge billow, and rode over the third with similar success. I watched them as they travelled rapidly on after having passed us, and not half a mile to leeward the first suddenly curled over and broke, and being succeeded by the others, they raised a mad whirlpool of foam, in in which our chance would have been poor indeed had it happened near us. Luckily the weather was now fine, with a light breeze, or we could not have come out over these shoals.

The sight of these seas increased our anxiety for our missing boats; however, we now saw the royals of the Fly on the horizon, and hoped to meet them when we got on board. We at length deepened the water to four fathoms, when the sea got less heavy and more regular, and at two o'clock we reached the ship. No news of any of the absentees had been heard, and serious apprehensions were entertained on board for our own safety and that of the cutter, as the day after we left the ship, it blew nearly a gale

* Captain Blackwood was now steering, and he will, perhaps, forgive my saying, that I always felt perfectly safe in a boat while the yoke-ropes were in his hands, whatever might be the character of the sea. In this particular instance, the least unskilfulness or want of judgment would have lost all our lives.

of wind, and the sea was so heavy as to break in over her forecastle as she lay at anchor. They had no boat on board but the dingy, and so many men away as hardly to have enough to work the ship if it had been necessary to weigh anchor.

May 15.– We ran down to the southward, where we were joined by the Prince George, and shortly after Mr. Pollard came on board with the cutter. He had run down along the coast as close as he could without seeing any signs of the missing boats. As it was possible they might have hauled off the coast and missed us in some of the bad weather we had experienced, and then steered for Bramble Key or Erroob, the Prince George was despatched to those places to look for them. The cutter was re-victualled for six days, and sent again to search the coast in the bottom of the bight off which we were, while the Fly beat up to the north-east to examine the coast in that direction. Mr. Macgillivray volunteered to go in the cutter with Mr. Pollard.

May 16 to 19.—During these four days we had the most lovely weather, but the winds were so light that we only got about thirty-five miles to the windward of our former anchorage. The edge of the bank was traced thus far, and the neighbouring sea outside sounded, but the land was too distant for us to do more than just trace its outline approximately. At our farthest eastern point the shoals seemed to have a tendency to close in with the land. Just before sunrise in the morning, high land was seen

upon two occasions: once dimly in the east, and once more distinctly bearing N.N.E. The latter consisted of two peaks, and a lower range stretching from them to the west. They subtended an angle with the horizon of more than 11′ of arc, which, if their distance was presumed to be 60 miles, would make them upwards of 4,000 feet high. From their relative clearness, however, as compared with Mount Aird, which was 30 miles from us, I should be inclined to suppose they were more distant than 60 miles, and therefore higher than 4,000 feet.

The air was now dry, cool, and pleasant, the thermometer in the shade not being higher than 79°.

On the 19th we ran back to our old anchorage in 8°, within sight of the land, and fell in with the Prince George. She had been to Bramble Key and Erroob, without learning anything of the boats. The cutter being also in sight, was recalled, and reported a similar result.

As the cutter had not examined the whole of the bight, Lieut. Ince and Mr. Porcher were sent away in her again.

Mr. Macgillivray told me that after running down along part of the coast, they had, on the 17th, gone into a large fresh-water channel, the water at half a mile from the sea not being even brackish, with several arms branching from it; and landed for a short time, near a large deserted house. On returning, they found ten large canoes occupying the

mouth of the channel, containing about 150 men, who divided into two bodies, and advanced to surround and attack them. As the cutter had to beat out of the channel, and might in so doing get aground on unknown shoals, they determined to act decisively, and if necessary bring the savages to action at once. They accordingly bore down towards them. The canoes advanced in regular order, the men shouting, splashing up the water with their paddles, beating the sides of the canoes, and handling their bows and arrows. When within distance, several arrows were discharged, which fell near the cutter, but struck no one. On this they fired upon them with ball, and several of the natives fell. The canoes then retreated in great confusion, leaving the passage open, of which the cutter took advantage to pursue her way. Mr. Macgillivray observed that on firing, several leapt overboard on the lee side of the canoes, and resting their arms on the gunwale, continued to discharge their arrows while in the water, with the canoe as a breast-work. The necessity for bloodshed was to be regretted, but exposed as our boats now were, singly, to such great odds of numbers, it was absolutely essential to teach the savages the great superiority of our weapons, and the danger of attacking us.

May 20 and 21.—We remained at anchor waiting for the cutter; the Prince George being anchored in three fathoms, several miles nearer the shore. The 20th was beautiful weather, but on the 21st it blew

a strong breeze, aud the sea was very heavy, great rollers traversing the flats to leeward, and breaking all round us in water three and four fathoms deep. We accordingly began to be very anxious about our cutter, and on the 22nd, the weather being more moderate, we stood in towards the Prince George, as far as the water would allow. Here we found the cutter, which had with great difficulty made her way out the preceding afternoon, through a tremendously heavy sea. None but an excellent boat could have lived in it, and she was much shaken and began to leak a good deal.

The day after she left us (*i.e.* on the 20th), she stood in to the mouth of a fresh-water arm, four or five miles wide, and while examining it, no fewer than sixteen large canoes, with at least a dozen men in each, suddenly emerged from different parts of the shore, among the mangroves, where no sign of them could previously be seen.

They did not attack her, however, but seemed watching their opportunity in case she should get into difficulties. One very wily device they put in practice, which deserves notice. While the cutter was at anchor for dinner, one or two large logs of wood were perceived floating down, of which little notice was taken, till, when within about a quarter of a mile, Lieut. Ince, having a remarkably keen sight, observed a little splash in the water at regular intervals alongside of one. The men insisted it was only a log of wood; but on firing a musket-ball near, up started several men in it,

and paddled away. It was a canoe half sunk in the water, with the natives crouched down and propelling it by their hands over the side.

We had now used every effort we could think of to discover our missing boats, without success. Neither the ship nor the Prince George could approach the shore nearer than eight miles; our boats were reduced to the cutter and one gig, so that we could not send a sufficient force to thoroughly explore all the fresh-water arms and channels, swarming as they were with hostile inhabitants. Our provisions also were running short, so that we should be compelled very soon to leave the coast. We feared our boats had either been swamped in the heavy seas that roll over the mud-flats lying off the coast, or, running for shelter into one of the fresh-water inlets, had been surprised and cut off by the natives. The latter seemed the most probable supposition; so, as a last chance, Captain Blackwood determined to go to Erroob, and endeavour to persuade one or two of its inhabitants to return with us to New Guinea, in order that by their means we might perhaps procure a peaceful interview with some tribe of the New Guinea people, and thus at least learn what had been the fate of our shipmates. As soon, therefore, as we had got in our cutter, we beat to windward with the Prince George in company this afternoon, and the next day sent her to procure eggs and spinach at Bramble Key, while we stood for Erroob, where we anchored in Treacherous Bay on the morning of the 24th.

CHAPTER X.

LANDING AT ERROOB—EXCITEMENT AMONG THE NATIVES—VISIT SEEWAI, AND BRING HIM ON BOARD—PROMISES TO ACCOMPANY US, BUT DISSUADED BY HIS FAMILY—DRYING A DEAD CHILD—SEEWAI AND MAMMOOS AT WAR—SKIRMISH AMONG THE NATIVES—SOME PLACES SAID TO BE "GALLA" (TABOOED?)—MAMMOOS PROMISES TO ACCOMPANY US, BUT BACKS OUT—APPARENT DREAD OF NEW GUINEA—WE RESOLVE TO RETURN AND LIGHTEN THE PRINCE GEORGE, IN ORDER TO TAKE HER INTO THE RIVERS.

May 24.—On anchoring, we observed a number of green boughs stuck upon the point to the west of us, and several poles newly erected on the beach at Beeka, the plantation there being all freshly fenced in with stout bamboo palings. A canoe came round from the east point, but approached us in a very guarded and cautious manner, and shortly retreated to a party of women, whom we saw ashore near the end of the pathway that leads across the island. Shortly after the canoe again approached us, and met our cutter that was going ashore with a party of officers, in a friendly manner, but were very earnest in persuading them not to land at Beeka, but to go to Keriam. When the natives came on board they were as friendly as usual, and began bartering their curiosities as

TREACHEROUS BAY ERROOB.

245

before; but there was evidently something the matter ashore which we could not understand.

I accompanied Captain Blackwood in the first gig to Keriam, outside which much new fencing had been raised. Several men ran down to receive us, of whom the principal were two called Burrooma and Keouck, who waded off to us and got into the boat.

Mammoos was not visible; and as we wished first to apply to old Seewai, as the best natured and most honest of the islanders, we inquired for him. They said he was round on the other side of the island, at his own place of Mŏggōr. Arrived there, he was not to be found at first, but we were received with the usual shouts of welcome by the rest, especially by the children; and on walking into his plantation, we met him returning from the hill with a load of fire-wood on his shoulders. He was delighted to see us, embraced us most affectionately, and immediately assented to our invitation to go on board the "ow shippo," and spend the evening. They seemed all very busy making new fences and building new huts. We saw the commencement of one of the latter. Eight or ten stout posts about five feet high, were driven into the ground at equal distances, forming a circle of fifteen feet diameter. Round these, at equal heights, were fastened three hoops of bamboo, both inside and outside the posts, but a space in the lower hoops was left between two of the posts, where the low door

would come. They afterwards fasten tall poles of bamboo upright to the hoops pretty closely all round, and bringing their ends together, tie them to a stout centre pole, which rises up from the interior and protrudes through the roof. Onto this frame work they weave and fasten a very thick thatch of grass, and palm-leaves split into thin strips, leaving only one small opening for the door, to enter which they must crouch on the hands and knees. The houses, then, as mentioned before, look just like great beehives.

Under some trees outside the fencing were sitting two old women, one of whom was Seewai's wife, the other Keouck's. The latter had on her lap the body of a child, a few months old, and which seemed to have been dead some time. It was stretched out on a frame-work of sticks, and smeared over with a thick red pigment, which dressing she was now renewing. It was much shrunk, with the skin hanging in loose folds, but had no other appearance of decomposition. As soon as she had smeared it all over, she hung it up behind her in the shade of a bush, talking and laughing quite unconcernedly. Keouck said it was his "piccaninny." The two women had their heads closely shaven* and smeared, as well as their faces, with a white pigment, but had no other signs of mourning about them.

* It was principally for shaving and cutting their hair, I believe, that they so eagerly desired our bottles, as they always used bits of broken glass for that purpose.

Seewai had sent for some cocoa-nuts for us, and when they came, presented four to the Captain and two to me. He and Keouck then came on board with us, Seewai bringing his son, a boy about eight years old.

On passing Keriam, both Seewai and Keouck begged to be allowed to squat down in the stern-sheets of the boat, so that they might not be seen; Seewai saying, "Keriam no good! Mammoos no good! sarreg, sarreg!" We, from this, concluded that Mammoos and Seewai had quarrelled, and that their respective partisans were at war with each other, and that this was the reason of the excitement we observed on the island, and probably of the new fences round the huts.

We saw Mammoos and others waiting for us at Keriam, but at Seewai's request kept out, and steered for the ship, shouting to them we would come and see them to-morrow.

On getting on board we set to work to explain to Seewai that two of our boats were missing, and we feared either wrecked or got among the New Guinea people. By the aid of the vocabulary, and by Melville's extempore sketches, we made them clearly understand this, and that Mr. Millery, who was a great favourite of their's, and known by them as "Tam," was one of those that were lost. We then explained to Seewai that we wanted him to go with us to talk to the people of Dowdee, that they might inform us where our people were. At this

Seewai shook his head, drew his finger across his throat, and said "Dowdee no good! arress, arress!* sarreg!" On shewing him a large axe, however, and offering him this, and plenty of small ones, and assuring him that we would take care of him with our "ow sarregs," he at length professed to be willing to go. He must, however, first get a stock of ketai and boonarree (yams and cocoa-nuts), to which we assented. Soon after dark they said they were cold and wished to go to sleep, so we made them up a comfortable bed of sails in the steerage. Between nine and ten o'clock, catching sight of a native pipe hanging up in one of the cabins, nothing would do but they must have a smoke; so we took them on deck, and after swallowing a mouthful or two, and drinking copiously of water after it, they remained quiet till morning.

May 25.—At daybreak this morning Seewai and Keouck became quite clamorous to go home, saying, "coskeer ee-ee, piccaninny ee-ee!" or "their wives and children would be crying for them." As our only light boat, the first gig, was ashore, where Captain Blackwood and Lieut. Shadwell had been all night making astronomical observations, we could not land them before seven o'clock, when I took them round in the first gig to Moggor. In passing Keriam, they observed the same precautions

* "Arress" means war, or strife, or fighting. "Sarreg" means either a bow, or to shoot with a bow. They also apply the same name to our guns and pistols.

as last night. On our arrival at Moggor, they explained to their wives what we wanted them to do, but the old ladies were evidently strongly opposed to any such measures. I essayed all my eloquence, setting forth the short time their husbands would be away and the care we would take of them, and then enumerated all the wealth for which I could recollect Erroobian designations. Sapăra, ow sapara, nipa, tarpoor, sucoob, wallee,* repeating each word several times to designate the quantity we would give them. I at last assured them that if Seewai did not go I should apply to Mammoos, and that he would go, and then become the possessor of all these riches. This last argument had an evident effect, and slackened the old ladies' opposition a good deal. Both Seewai and Keouck then said they would go, and set off to wade to the boat, with several men and children bringing cocoa-nuts and yams. Before we reached the boat, however, Keouck stole away, and on getting to it Seewai's little boy began to cry, and cling to him, and pull him away; and I could see his heart failed him very fast. His wife then began to shout very energetically to him from the shore. He pointed to her and then to his child, saying, "Coskeer ee-ee, piccaninny ee-ee! Seewai lola Dowdee." I endeavoured to laugh him out of his reluctance, and urged him to get into the boat, but

* These words mean, axe, big axe, knife, glass bottle, tobacco, cloth or clothes; the latter being gaudy cotton pocket-handkerchiefs.

in vain. In short, even if willing to go, he was evidently not his own master, and being a very worthy, good creature, he could not resist the entreaties of his family; so at last we left him with them, and went to Keriam. Here I found only women and children, and on going up to the huts I perceived not only new outer fencing, but poles of bamboo slung from the trees between the huts, and strings passing from one to the other, dividing all the interior into small square spaces. On pointing to these they all cried, "galla! galla!" an expression I had not heard before.

Mammoos, they said, was gone to get ketai (yams), which I did not believe, as that is usually a woman's business. As we returned to the boat, a man passed by the village, fully armed with bows and arrows, and went hastily on to Beeka. On returning to the ship, we could see small parties of men and women posted at different parts of the edge of the bushes, between Beeka and the pathway, and eight or ten armed men stood on a bare ridge, as if expecting an enemy.

Just before noon Captain Blackwood and Mr. Evans landed at Beeka, opposite the ship, to take a meridian altitude, on perceiving which, the armed men ran down from the heights, and seemed rather inclined to be insolent. One of them drew an arrow across the back of Mr. Evans's neck as he was observing with the artificial horizon, and another raised a drawn bow at one of our men. No

notice was taken of it, but when the boat was returning, and about 150 yards from the shore, five arrows were discharged at it, which fell all round it, but did no damage. Two muskets were fired at them, but they stepped behind the rocks, and escaped injury.

In the afternoon Lieutenant Shadwell and Messrs. Macgillivray, Melville, and myself, went in the first gig to Keriam, to see Mammoos, both to inquire the reason of this conduct, and to ask him to go with us to Dowdee. On the point, as we approached, stood Mammoos and another, waving boughs and shouting, "Poud! poud Keriam!" and on our answering, "Poud! pouda!" they all came down as friendly as possible, both those who had shot at our boat and the others. We went up into the village, and, as well as we could, lectured Mammoos on the conduct of his followers. Dzoom and four others were pointed out by Freathy, the coxswain, as those who had shot the arrows; but they strenuously denied it. I insisted, however, that they had done so; and, with a very grave face, pointed to our guns, and told them if they "sarreg'd" us we should "sarreg" them. During this I observed one or two old women carefully removing bundles of war arrows into the bush behind the huts, ready, no doubt, for their friends if we should quarrel. They all began to look very serious; however, we carried it with a high hand, and pretending to be very angry, shook our guns at them, till Mammoos cried, "Poud!

poud! lola sarreg! lola sarreg!"* I asked him then to come round with us in the boat to Moggor, as Shadwell had never seen the other side of the island. To this he rather reluctantly assented, two or three of his followers saying they would follow him armed, apparently to support him, if necessary, against Seewai's party. To this we made no objection, and he got into the boat and went round with us. He begged us, however, to land at Badōga, about half a mile before we came to Moggor, as he could go no further with us, but would await our return there.

Just beyond Badōga a fence of boughs was set up from a small rocky point across the beach to high water mark, and a rope was stretched thence to a pole set up on the reef. Beyond this we came to a clear space of sand, on which there were no recent footmarks, and which seemed to be the borders of the hostile territories, as at the next point there was another fence, beyond which we saw Keouck concealed among the edge of the bushes. We called to him, but he put his fingers to his lips, and stole among the trees till he got round the next rocky point, when he came out to us. We concluded he had been acting as sentinel or spy on the Keriam party, though he yesterday was at that place, and joined us there on landing. We walked on for a mile or two; saw Seewai at Moggor just as he was returning from the hill with his wife, both

* "Peace! peace! no shooting, no shooting!"

loaded with yams and fire-wood, and then returned to the boat. There was still plenty of fresh water running down the rill in Seewai's garden, though not so much as before, and Keouck's dead baby was still hanging in the shade of a bush, apparently having had another dressing of red pigment. Keouck and one or two more came with us to the boat, taking no notice of Mammoos, who was waiting for us. He returned in the boat, but on passing Keriam, insisted he must land and sleep there for the night, and that on the morrow ("sana gegger,"—another sun) the women would have got plenty of large ketai, and if we would come for him in the boat he would go with us to Dowdee. Though I had no faith in his promises, we agreed to this, and putting him ashore returned to the ship by sunset. Mammoos shewed us the marks of several arrow wounds to-day on different parts of his body, some of which, he said, he had received at Dowdee. One of them was in his cheek, and had evidently broken his lower jaw, which was a little out of place in front. He was apparently a shrewd and resolute old rascal, with a composed and observant countenance, and a mingled expression of cunning and audacity.

May 26.—As soon as the ship's company had breakfasted, Captain Blackwood sent me in the first gig to Keriam, to try and get old Mammoos on board, according to his promise. At nine

o'clock,* we found it dead low water, and so shoal that we could not get in at the usual landing place at Keriam, but had to go about a hundred yards farther on. Here Mammoos at once came down and got into the boat, but begged we would stay a little and get some ketai, of which several parties of women came successively with bundles, and bartered it at a regular rate, under Mammoos's inspection, the price being four roots for a wine bottle or a fig of tobacco. The roots were better than any we had previously got, many of them as large as two fists, and some much bigger but not of so good a quality. In this way we purchased a much larger quantity than we had ever got before at one time, and it appeared as if the yam season was just coming in. They brought also a few roots, which both looked and tasted like ginger, and which they called "kerāker." Having nearly exhausted their stock, I was just calling to Mammoos, who stood in the bow of the boat, to come and sit down by me, and go off to the ship, when a boy, called Babouck, came running along the beach with some intelligence apparently of importance. On hearing it, Mammoos sprung out of the boat, and began pushing her off, pointing to the ship, and waving us to go, saying "sarreg! sarreg!' Thinking we were going to be attacked, I seized my gun, and told the men to shove off.

* Last night the water was equally low at five in the afternoon, so that the tides are very irregular in their times here.

The natives had run back to Keriam, and were now coming out armed with bows and arrows, looking along the beach, in which direction I now caught sight of a small party coming along at full speed from the south side of the island, or the direction of Moggor. Mammoos's party advanced in an irregular straggling line, with the women carrying bundles of arrows on the flanks and in the rear. We pulled off a little way, to be out of arrow-shot, and then lay on our oars to see the result. The small party coming up seemed to be the inhabitants of the next village, and joined Mammoos's party, and we then saw another body of about thirty men coming round the point, and a canoe with about six more. These were evidently enemies, or Seewai's party.

They approached each other at full speed to within about thirty or forty yards, when they both halted, sheltering themselves behind rocks and large stones; and there was a pretty brisk interchange of arrows. The sharp twanging or smacking of the bows, the rattling of bundles of arrows, and the hurtling of arrows through the air, and their glancing from the rocks, was heard above the shouts and cries of the combatants. The fierce gestures, quick and active movements, and the animated attitudes of the black and naked warriors, ornamented as many of them were with glittering pearl shells, or red flowers and yellow leaves hanging from their hair, and the crouching of the women, known by their petticoats, on the rear or skirts of the

battle, with fresh stores of ammunition, formed for a short time an interesting and exciting spectacle. After a minute or two's skirmishing, they all rushed together, hand to hand, and formed a confused mob. The shouting and noise was then redoubled, and there was a short clatter of long poles, sticks or canoe paddles, which we could see waving above their heads; and we thought some of them were using their arrows as spears or daggers. Still no execution seemed to be done, as we saw none of them down; and in a very brief time the poles and paddles were all held erect, the women closed up, and the war of deeds seemed to end in one of words. At last we heard shouts of "poud, poud," beginning to predominate, and they began to separate, and some of them to sit down on the rocks. Supposing it was all over, but not wishing to interfere with them while this excitement lasted, we returned to the ship to report the matter. Throughout the affair, there appeared to us to be "more talk than work," though at first I thought it was going to be a "very pretty fight."

About an hour after I got on board, a large canoe came from Keriam, containing both Mammoos and Seewai, and many of their followers. As they came up, they shouted "poud! poud! poud Mammoos, poud Seewai!" and both parties seemed very glad it was over. Several of them were slightly scarred with arrow marks, some on the chest and neck; and Mammoos had a pretty sharp

cut on the elbow, that looked like the blow of a hatchet. This Dr. Muirhead dressed for him, and he did not seem to think much of it. From some of the other marks, several of them had evidently had a very narrow escape. It seemed as if they had seen the arrow coming, and avoided it by twisting the body as the Australians avoid spears. They brought for sale several of their war arrows that had been used and spoilt in the skirmish. These were much larger and finer than any we had before seen, being highly carved and ornamented, and having a small bone point and barb, like that on the Australian spear (page 112), but smaller. We found that several of the men had now petticoats like the women, worn either to deceive their enemies in the battle, or else put on to come on board ship with, for the purpose of concealing plunder. We actually detected one or two putting them to the latter use, and as this morning we lost both our carving knives out of the gun-room, we vehemently suspected master Duppa, whom we afterwards remembered to have seen prowling about below wearing a petticoat.

Both Mammoos and Seewai now said they would go with us to Dowdee if we would stay till to-morrow, as the women were out collecting ketai in order to take with them as sea stock, and Captain Blackwood determined to give them another trial.

We took advantage of the delay to enjoy a good walk over the island, and the cutter being got ready

to land a large party of us, Keouck and another begged a passage in it. When, however, they found it was going to land at Beeka, opposite the ship, they got into a dreadful fright; said that Beeka was "galla, galla;" and that Mammoos would kill or strike them, "Mammoos aress;" and they would not be pacified till promised they should not be put ashore there, but taken back to the ship when we had landed.

They mentioned Dzoom having shot at the Captain at Beeka the day before, joining it with the expression, "Beeka galla." This makes me think that "galla" may have a signification similar to "taboo" among the Polynesians, and that Beeka was now tabooed, and that our landing there was an offence against their customs, for which the arrows were shot yesterday; but that now they considered us as above the taboo, and at liberty to do as we pleased.

They also said that the east point of the island, which they called Kaiderry, was "galla," and if I understood them rightly, that there was still war between Kaiderry and Keriam. At all events, on walking across I found several huts between Kaiderry and Moggor shut up, and the paths through the mangrove cove to the west of Kaiderry crossed by stout lines and bamboos, tied from tree to tree, as if to give notice of there being no communication. They received us at Kaiderry with their usual friendly welcome, and two parties of our officers walked completely round the island. The latter of these (Dr. Muirhead and Mr. Walsh) having de-

layed in order to collect shells, got benighted, and arrived at Keriam some time after dark. The natives treated them kindly however, and Dzoom walked with them to Beeka, where they were obliged to come in order to make a signal for a boat by firing a pistol.

The island of Erroob is about eight miles in circumference, or three miles long by two in width, and does not contain much above a hundred full-grown men.

It is singular to find in such a narrow space, and small community, two or three separate parties, sometimes or often at war with each other, each occupying their own district, and guarding their frontiers from their neighbours. We could not make out that they had any regularly constituted chiefs, or anything like hereditary authority. Seewai and Mammoos were virtually the chiefs or heads, each of their own party, but their authority seemed rather that of force of character or intellect, or the result of circumstances, than that of law, compact, or custom. Who was the chief among the Kaiderry party we could not make out.

On relating at Kaiderry this afternoon the skirmish I had seen in the morning, one of the men said very quietly, "baes, baes!"* which, on consulting the vocabulary afterwards, I had the satis-

* The sound was exactly that of our English "base!" which, considering the meaning of the word, is a curious coincidence, but not the only one in the words that were collected.

faction of finding meant "lies, lies!" However, as I had pocketed the affront at the time, I did not think it necessary to *send him a message* in the morning.

May 27.—As Captain Blackwood and I were going to Keriam this morning, to fetch Mammoos, we met him coming in his canoe. I wished, however, to land, as Dzoom had promised to bring me the barreet this morning. I could not find either the barreet or Dzoom, but Mammoos and Doodegab promised solemnly to go with us to Dowdee, after we had exhibited to them a sword, a broad axe, tomahawks, and other things, and offered them as a reward. They came on board with us, where we found many others, and several canoes, very busy bartering their vegetables and curiosities for the few knives and other things which still remained in the ship. As soon as we got on board, orders were given to weigh anchor. The heaving round of the capstan seemed rather to astonish them, and I could see Doodegab beginning to look very anxious. At the rattling of the chain topsail sheets, when the topsails were sheeted home, most of them retreated to their canoes, and, in spite of all I could do to detain him, Doodegab got on the gangway ladder, and shortly disappeared into a canoe. One or two still remained on deck with bundles of ketai roots, and Mammoos pottered about with a composed countenance, endeavouring to get a purchaser for them, quietly assuring me he was going to remain with us, till, as the ship began to gather way, he bustled the natives overboard, then climbed on the

hammock nettings to speak to them, and after a last endeavour to sell a bunch of ketai, and get every thing he thought he possibly could of us, he stepped into the main chains, whence he very quietly dropped into the water, and got on board his canoe. It was now evident the old rogue never intended to go with us, and that all his assurances were merely intended to detain us, in order to get the greatest possible quantity of "sapara" and "nipa" for himself and his followers.

They all seemed to regard Dowdee with considerable horror, and said the people of Dowdee would kill them; making signs, by biting their arms, as if they would also eat them afterwards.

Captain Blackwood now resolved we should make one more effort by ourselves on the coast of New Guinea, to get news of our missing boats. For this purpose he determined to lighten the Prince George and trim her upon an even keel, and take her into an inlet in the bight that had not yet been examined, and search some of the houses, to see if any fragments of the boats, gear, clothes, or other matters could be found; and endeavour, either by friendship or force, to communicate with some of the inhabitants, and try to get some information from them.

On standing towards Bramble Key, of which I had now learnt the native name (Caedha), we met the Prince George with two casks of fresh eggs on board, and this day and the next she was prepared, as we ran down to the north, for her excursion over the mud flats.

CHAPTER XI.

TAKE THE PRINCE GEORGE INTO A RIVER IN LAT. 7° 50′—LARGE VILLAGES—SKIRMISH WITH THE NATIVES—LAND AND EXAMINE AN IMMENSE HOUSE—BRING OFF SKULLS AND CURIOSITIES—SHOOT TWO PIGS—PROCEED UP RIVER, BUT STOPPED BY BAD WEATHER AND SHOAL WATER—SEE OTHER VILLAGES AND MANY NATIVES AND CANOES—RETURN TO VESSEL—DAMP CHARACTER OF COUNTRY—DELTA OF LARGE RIVER—BEST PROBABLE METHOD OF PENETRATING THE INTERIOR OF NEW GUINEA.

May 29.—We anchored at 10 A.M. in six fathoms, near our old anchorage, a little south of 8°, and at noon we sailed in the Prince George, taking also the ship's cutter and her crew with us. Our party, in addition to the Prince George's regular complement, consisted of Captain Blackwood, Mr. Walsh, Mr. Weeks, and myself, with two marines. We were all well armed, and the Prince George's six-pounders were cleaned and got in order. Our course from the ship was north-west for about twenty miles, leaving the opening, where Captain Blackwood and I had previously been, some ten miles on our starboard hand. As the tide was rising we carried four fathoms, and three and a half, all the way, with a soft muddy bottom, and a few patches of hard sand. We steered for the mouth of a large inlet, three or four miles wide, and when the western head of this bore

due west of us, we had a depth of two and a half fathoms. The land to the eastward of us curved gradually out along the coast, without any decided point or headland. It was all equally low and flat, and covered with jungle like that we had seen before.

On a small beach, however, on our starboard hand a little to the eastward of us, we saw several natives and a house, and presently two or three small canoes were shoved out from the mangroves, and followed us. One had four men in, one of whom had something red on his head, that we thought might be a red nightcap belonging to our missing boats, but which was probably a red flower. Although we were going up with a fresh breeze and a flood tide they neared us rapidly, pausing and shouting when they were about 300 yards off. The water was now slightly brackish, and fifteen feet deep. We shortly wound round a bend of the river and lost all view of the sea. About half-past five o'clock we passed a large native village on the east bank, and could see the roofs of four or five immensely long houses among the trees, with smoke oozing through the thatch, and a crowd of people at the water's edge, from which a large canoe came out and followed us. We also saw several other canoes coming up on each side of the river. Just at sunset we anchored near the middle of the stream, which was full two miles wide, the depth of water being three and a quarter fathoms, or about twenty feet. The flood tide was still running up very rapidly, at the rate

of full three knots an hour, but of course we could not proceed in the dark. The canoes ran up beyond us on each side, and then meeting in the middle of the stream, pulled down towards us in a body, against the tide, which they easily stemmed.

In the largest canoe we counted twenty-five men standing up and paddling, with others sitting down; in another there were ten men; in others, five, four, and one. They seemed to be holding a consultation, with much shouting from one to the other, but gradually drew near to us, evidently preparing to make an attack.

As it would never do to have an unknown number of savages prowling round us all night, shooting probably at the watch on deck, and as we could not tell but some accident might happen to our little vessel up these rivers, making it necessary to return in the boats, or what other circumstances might occur, which would render it advantageous that these people should fully understand and dread the effect of our arms, Captain Blackwood determined to take advantage of the first decided act of hostility on their part, to punish them severely and give them a lesson. He accordingly ordered the muskets to be loaded, called the hands on deck, and directed Grant, the coxswain of the cutter, to hold his boat in readiness, so that, if it became necessary to fire on the natives, he might push off and endeavour to seize one or two of them, to bring them prisoners on board. From them it was

hoped we might acquire some sort of information, or open a communication in a more friendly manner with the rest.

It was now rapidly getting dusk, and the canoes were advancing in a line, the men flourishing their paddles, encouraging each other, and handling and adjusting their bows and arrows. When they were within about 100 yards, Captain Blackwood and myself stood up on the taffrail and waved our hats, shouted "poud, poud," and told them in Erroob we were friends, and invited them to come to us. They ceased their cries and listened; and I thought once I heard them say to each other, "Errooba." They seemed to understand "toorree," as they answered it with a general cry, but in words we could not understand. We held up hatchets to them, but nothing would induce them to depart from their hostile attitude; and when about sixty yards from us, two arrows were discharged, which passed over our heads. Captain Blackwood then gave the word to fire; and there was a general discharge, several of the men loading again and firing without orders, and before it could be stopped I dare say thirty muskets had been fired.* The large canoe then seemed quite empty, drifting up with the tide, and pursued by Grant in the cutter. As soon, however, as the firing ceased, several men

* The men were just at this time becoming exasperated, with the loss of their messmates in the boats, and expressed great hatred against the blacks.

started up in it and began to paddle away, with such swiftness, that our cutter could not overtake them. The smaller canoes likewise kept a-head, and at the same time kept up a smart shower of arrows on the cutter, several of which fell into her or struck her masts, but luckily did not wound any of our men. It is probable, however, that ten or a dozen savages were struck, of whom several were no doubt killed. We could just discern in the fading daylight that the canoes made for the west bank of the river above us, in which direction we afterwards saw fires, and also flashes of light occasionally, like those of fire-arms, which seemed to be signals, as they were apparently answered by similar flashes, at the village down below us on the east side.

At half-past eight o'clock the tide turned; the water was then slightly brackish, and three and a half fathoms deep. At half-past two, in the middle watch, it was low water, and the depth was then two fathoms: the water perfectly drinkable.

May 30.—It rained hard during the night, and this morning broke dark and rainy. As soon as we could see before us, we weighed anchor, and ran up with the last of the flood tide, the wind being very light and scarcely perceptible. We saw large canoes crossing the river, a mile a-head of us, and others pulling up each side. One canoe, with four men in it, pulled up boldly within a hundred yards of us, as if to reconnoitre. We could see smoke

oozing through the roofs of all the large houses in the village to the south-east of us, shewing it to be very populous. Some of the canoes which went up along the banks of the river appeared to be laden with large cargoes of something covered over with matting, and propelled by three or four men only. It was often difficult to discern even a large canoe moving near the banks, so wide was the river, and so dark the shade of the woods under which they moved. We could now see no mangroves, but the woods consisted of lofty forest trees, mingled with many palms. The most abundant of these palms was instantly recognised as the sago-palm by Shadrack, the steward of the Prince George, a native of the island of Kissa, who had formerly been servant to Mr. Earl at Port Essington. When near the bank, Captain Blackwood also recognised the bread-fruit tree, and there seemed a great variety of all kinds of tropical vegetation.

At seven o'clock, having drifted up about a couple of miles, we found ourselves abreast of a very large village on the west bank, apparently that to which the canoes retreated last night. There were three or four long houses and several smaller ones. Many people were standing in the balconies of the houses, and running down to the edge of the water to gaze at us as we passed. About a mile farther on, we passed another village on the same side, with one large house and eleven smaller, and a little above this we met the ebb tide. What little wind

there was, being against us, we were now obliged to anchor for six hours. The canoe with four men still followed us up, and kept within about a hundred yards of us, shouting apparently in defiance. We held up hatchets to them, and invited them in every way we could think of to come alongside, instead of which they had now the impudence to shoot an arrow, which fell near us. To shew them they were completely in our power if we pleased, we returned it by several shots fired along the water, pretty close to the canoe, on which they paddled off, and when about four hundred yards distant, another musket was fired with good elevation, and with our glasses we could see the ball splash in the water, rather beyond them, which no doubt surprised them a good deal, as we saw no more of them.

It was now determined to occupy the six hours' detention we must endure here till the next flood tide, by landing and examining the last village we had passed. We accordingly dropped down to it, and anchored opposite the large house, about 150 yards from the bank. About a dozen men were in the balcony of the large house, armed with bows and arrows, which they frequently discharged at us, but of course ineffectually. There was a great howling in the village, which we at first took for that of women and children, but afterwards discovered to be the native dogs.*

* These we could see with our glasses, and they resembled, both in appearance and cry, the dingo or native dog of Australia.

The village stood in an irregular, open space, the houses being about fifty yards from the water's edge, and the thick woods about fifty yards behind them. This open ground was covered with heaped bushes of low trailing herbage, and large-leaved succulent plants concealing the lower parts of the houses a good deal. As we could not tell what number of people might be in the village, and the large house seemed capable of holding two or three hundred men with great facility, we fired a round shot over it from one of the six-pounders. On this the men disappeared from the balcony, but shewed themselves again as we were landing. We took both the cutter and Prince George's gig, being altogether about a dozen of us, well armed; but the rain was pouring so incessantly as to make it difficult to keep our fire-arms in a sufficiently dry state to be useful. The banks of the river were composed of black mud, and were now about three feet out of water, very soft and rotten, and our only means of landing was by the slippery stem of a fallen tree, a little below the last house. Having with some difficulty all got ashore, we proceeded in single file along a muddy little path, leading in front of the houses. A ditch, full of water, crossed our path, containing several good sized canoes, shewing us the way in which they kept them hidden and ready for immediate use,

Several of them were white, or white patched with brown; but others were of a reddish brown all over, with sharp snout, bushy tail, rather small body, and erect ears, precisely like the dingo.

as even at low water it would have been easy to have launched these smooth, round-bottomed things over the mud. Leaping across the ditch, we found the smaller houses apparently quite empty and deserted. The Prince George now fired two more of her six-pounders, to clear the long house if necessary, and Captain Blackwood ordered Grant, with five hands, to enter it at the back, while we took it in front. Captain Blackwood was then running on again along the muddy path, when up jumped a fine black pig, and began to trot off for the woods; up at the same time went the Captain's gun, and, as piggy did not fall, up went mine, and he was saluted by a dropping fire all down the line. He did not give us time to consider whether he was a wild pig or a tame one. Just as we had discharged our guns (at the very moment, too, when we might have most wanted them), down came the rain again with all the fury of a tropical shower, and we were obliged to run into and under the nearest houses, in order to load them with any chance of their going off afterwards. As soon as it ceased a little, we rushed out and made for the large house. I confess, as I came in front of it, and followed Captain Blackwood up some slippery poles that gave access to the front stage or balcony, I fully expected a flight of arrows whistling about us from the half-open doorways; and, had they been inclined to do so, the savages might have made a very pretty stand of it here, and fighting under cover, have at least wounded every one of us

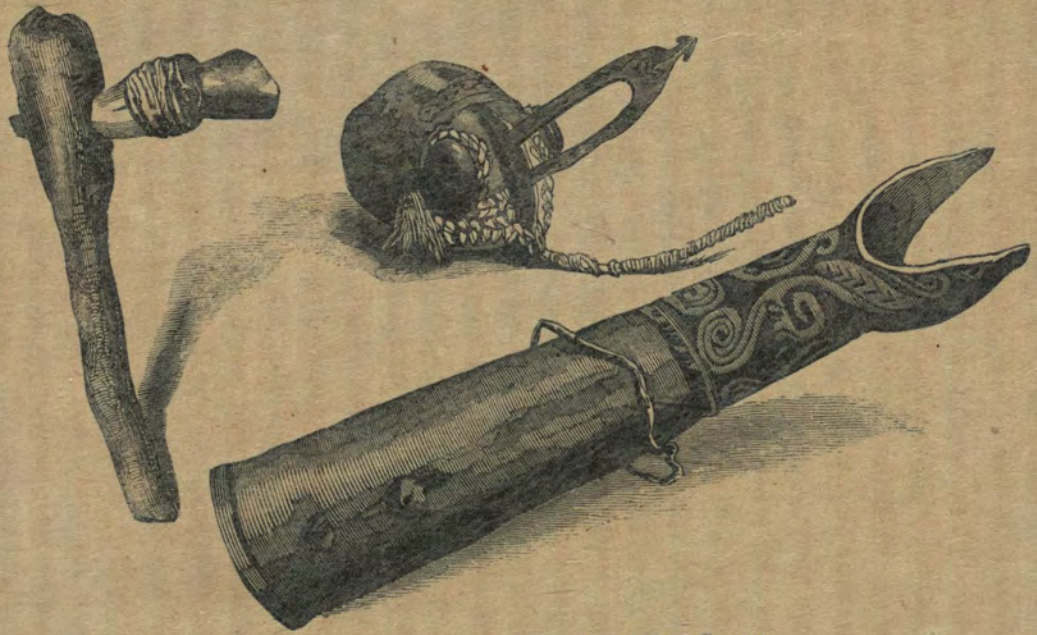
before we could have got at them. On darting into the house, however, we found it quite empty, and were soon met by our men, who had gone round to the back of it, and been equally unopposed. We had now leisure to look about us, and were struck with astonishment at this most remarkable structure.

The house, or whatever it might be called, was raised from the muddy ground about six feet, resting on a number of posts placed irregularly underneath it, most of which seemed to be stumps of trees, cut off at that height and left standing. The floor raised upon these seemed to consist of poles fastened across a framework, on which were laid loose planks, made apparently of the outer rind of the sago-palm, split open and flattened and dried. This floor was perfectly level and smooth, and felt firm and stable to the foot. It was about thirty feet in width, and upwards of three hundred feet long. Mr. Walsh and I both stepped it from end to end, and I made it 109 and he 110 paces long; both our paces were long ones, and I know my own to be upwards of three feet. The roof was formed of an arched frame-work of bamboo, covered with an excellent thatch of the leaves of the sago-palm. It was sixteen or eighteen feet high in the centre, from which it sloped down on either hand to the floor. It was perfectly water-proof, as, though it was still raining hard, not a drop came through. The end walls were upright, made of bamboo poles, close together, and at each end were three door-

ways, having the form of a gothic arch, the centre being the largest. The inside of the house looked just like a great tunnel. Down each side was a row of cabins: each of these was of a square form, projecting about ten feet, having walls of bamboo reaching from the floor to the roof, and accessible at the side by a small door very neatly made of split bamboo. Inside these cabins we found low frames, covered with mats, apparently bed places, and over head were shelves and pegs on which were bows and arrows, baskets, stone axes, drums, and other matters. In each cabin was a fire-place (a patch of clay), over which was a small frame of sticks, as before mentioned, about two feet high, three feet long, and a foot wide, as if for hanging something to cook or dry over the fire. A stock of dry fire-wood was also observed in each cabin on a shelf over head. One or two of these fire-places were also scattered about in different parts of the sides of the house. Between each two cabins was a small doorway, about three feet high, closed by a neatly made door or shutter of split bamboo, from which a little ladder gave access to the ground outside the house. At each end of the house was the stage or balcony mentioned before, being merely the open ends of the floor outside the end walls, on which the cross poles were bare or not covered with planks. The roof, however, projected over these stages, both at the sides, and much more overhead, protruding forward at the gable, some-

thing like the poke of a lady's bonnet, but more pointed. Inside, all the centre of the house, for about a third of its width, was kept quite clear, forming a noble covered promenade. It was rather dark, as the only light proceeded from the doors at the end, and the little side doors between the cabins. Near the centre, on one side, was a pole, reaching from the floor to the roof, on which was a kind of frame-work covered with skulls; of these Dr. Whipple brought away four, two of which he gave Captain Blackwood, who has presented them to the College of Surgeons. They were very curiously ornamented with a wooden projection inserted for the nose, black protruding lumps of gum, like short horns, in the sockets of the eyes, at the end of which were broad red seeds, and the mouth and lower jaw was smeared over with black gum, in which were stuck seeds, both red and white. On the base of the skull was fastened a handle of twisted cane, by which it was suspended upon the frame, but what was the form or nature of this frame there was too little light, and much too little time, to determine. We heard muskets fired outside, and shouting, and went to see what was the matter, but found it was only another pig shot, and one of the crew, an Irishman, with a rich brogue, in excessive glee in consequence. At the edge of the wood, behind the small houses, we found the first pig lying dead, with five balls through him, and directed both to be taken to the boats. One or two paths led into the woods here, rudely covered with sticks and planks and branches of trees, evi-

To face p. 274.



Skull, Hatchet, and Drum, from New Guinea.

275

dently to prevent passengers from sinking in the mud. The smaller houses were partly examined, but they did not differ in structure from the one described in page 228, although several of them were a good deal larger. The tails of some birds of paradise and the skull of a crocodile were seen, but I did not hear of them till we had got on board again, or should certainly have brought them off. We nowhere saw any sign or fragment of European articles or workmanship, nor iron of any sort or kind. There was little or no cultivation near the houses. Ripe cocoa-nuts were hanging on some rails, apparently to dry, and in one spot the earth had been dug and heaped up into a circular mound, with a trench round it, and on this some young plants had been set, but what they were we could not tell. There were only one or two plantain or banana trees, but a dense thicket of sago-palms grew all round in the forest.

After a much more hasty and cursory examination than I could have wished to give to this very interesting place, we returned to the boats with our spoils.* Of these the most precious part in our eyes

* When we came to re-embark, on trying the muskets, hardly one of them would go off. All our clothes were of course saturated with wet, and the rain running down the stock and barrel of the muskets and fowling-pieces, accumulated about the base of the nipple, and was drawn by capillary attraction up inside the percussion cap, and had wetted the powder in the tube of the nipple. For all boat work and rough work, where the musket is wanted always ready, but cannot be solely attended to,

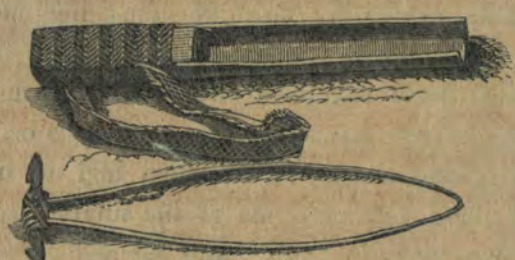
just at that moment were the two pigs, over which there was quite a jubilee of rejoicing when we got on board the Prince George. It was not indeed until they were all gone that the reflection occurred to me that we had in fact *stolen them;* but I could not for the life of me feel the proper degree of contrition for so heinous an act, and I very much fear should have utterly forgotten its enormity had we had an opportunity of stealing any more. The fact was we had been some time confined to salt provisions, and had now been several weeks on rather short allowance even of that. Our biscuit was made by contract at Sourabaya, and was full of weevils and their maggots. In short, a little fresh meat was a great temptation to all hands, and I will so far endeavour to make amends to the inhabitants of Pigville, as we christened this place, as to acknowledge that their pork was excellent. The pigs were of a small, well-shaped black breed, like the Chinese; one was a young hog, very skilfully treated, the other a sow with young.

Our other spoils consisted of curiosities, some of which that fell to my share are now in the British Museum.

The bow is much inferior to that of Erroob in

a contrivance to prevent this is much required. No sort of lock cover can be used, as a man may be speared or shot with half-a-dozen arrows before he could cast it off. Tropical rain comes in such a deluge that it is difficult to load without getting the cartridge wet through, and impossible to attend to that, and cover the lock at the same time.

strength; it is made not of bamboo, but of black close-grained wood; the string, however, is bamboo, like that of Erroob. All the arrows we saw were also slenderer than those of Erroob. We got the frame of a drum, similar to, but smaller than that of Erroob, a long flat wooden sword, of very heavy black wood, and some stone hatchets. These were similar to those of the South Sea Islanders—some made of jade, others apparently of a more earthy rock, a kind of flinty slate. The stones were bound round with splinters and inserted in handles of wood. We also got two instruments tied together, and which we always observed slung at the backs of the natives, the use of which we could not make out. These were a cane loop, with a toggle or handle, and a bamboo scoop, with a handle bound round with



twine, in which small beads (or seeds) were inserted. I afterwards saw some of these among the natives at Erroob, who said they came from Dowdee. They called the first "sungei," and the second "koiyōr;" and said the first was for twisting round people's necks, and the second for cutting their heads off—which merely showed they did not know what their real use was, as they are not at all

adapted for those purposes. I can only conjecture that the scoop is for extracting the pith of the sago-palm, and the loop is probably used for holding the junk of palm while the scoop is pushed into it.

Everything we saw ashore—the large sheltered houses raised above the ground, the dry firewood stored in them, the sticks and bushes on the path-ways, &c., denotes the climate to be a very wet one, and in all our excursions into New Guinea, we found almost continual rain.

As soon as we had got on board the Prince George, we saw about a dozen natives in the large house again, walking about apparently to see what damage we had done. I am afraid they must have thought us a shocking set of buccaneering savages. They seemed to be pointing with great surprise to our foot-marks, wondering no doubt what had become of our toes, and at the extraordinary shaped feet they must have concluded we had from the impressions of our shoes. There were two or three women among them, one of whom had an infant. Two of these went into one of the smaller houses, which were open in front,* and seemed to occupy it as their home, looking about to see if their

* Forrest, in his voyage to New Guinea in the last century, when he visited Doree, in the north-west corner of the island, gives a slight account of two sorts of houses, similar to those we had now seen on the south-east side. He says, the long large houses are inhabited by the married people and the unmarried women; and that the young men and bachelors only live in the smaller square houses. From what I saw to-day, this does not seem to be the case here.

chattels were safe, and afterwards sitting down quietly as if at home. With our glasses, we now had a pretty fair view of the people. Both men and women appeared rather tall than otherwise; some of the former were robust, but all the latter of a thin lanky figure. They were both perfectly naked, and their colour of a dirty brown. Their heads seemed small, and very low and square about the forehead; the hair was commonly short, close, and frizzled, but some of the men had it in long pipe-like curls. Their faces had a general resemblance to those of the islanders; but they seemed more ugly, and had a more fierce and savage looking expression of countenance. We could discern no marks or scars, either on the shoulders or any other part of their bodies. After looking over the village, the men assembled in the balcony of the large house watching us, and now and then shooting an arrow at us; but finding they fell short, soon desisted.

At dead low water we had two fathoms here alongside; and as soon as the flood tide made we weighed and proceeded, finding then two and a half in the centre of the river. As soon as we left, a canoe with two men stood off from the village and went across the river. About a couple of miles above Pigville the arm we were in entered another, which ran N.N.W. and S.S.E., and was about two miles in width. At the junction we found a bar of soft mud, with a depth of water of only about nine feet. The Prince George still drew eleven feet;

so that we stuck fast till the tide rose, and a little fresh breeze coming in from the sea dragged us through it. We went up this new arm to the N.N.W., but it was now sunset, and we were consequently obliged to anchor. The tide was then running with such force that the cutter, which was about 200 yards a-head of us when we anchored, was quite unable to stem it, when she attempted to return to us, and was obliged to anchor where she was, and the men to remain in the wet without their suppers till nearly nine o'clock, when the tide slackened sufficiently for them to pull down to us. It then ran quite as strongly the other way during the ebb. The water here was quite fresh with both tides.

The rain still continued to pour down, notwithstanding which, about seven o'clock, we saw a bright light in the north-west, like the reflection of some great conflagration. No flame was visible, nor could any be seen from the mast-head, and the fire was evidently some miles off. After continuing for about half an hour, it gradually died away. It was evident that it could not be a fire in the woods in their present wet condition, but whether it was a signal fire or an accidental conflagration of one of their large houses we could not guess.

May 31.—Heavy rain all night and this morning, and Captain Blackwood determined on not proceeding any further up these rivers, on account of the badness of the weather and the shoalness of the water for our deep little craft, but to return to sea

by the new channel we had got into. At nine o'clock, accordingly, when the ebb tide made, we weighed and went down with it. This channel shortly branched into two of about equal width, one running south, the other south-west. In the latter we saw two very large villages about a mile apart, each containing four or five of these great houses, and a crowd of two or three hundred people. A canoe was suddenly observed abreast of us, under the bank, with twelve men in it, and we saw another with both men and women coming from the direction of Pigville. When the twelve-man canoe had reconnoitred us, she pulled in for the bank, and landed two boys, apparently that they should be out of harm's way, and then gave chase to us. A small fleet of canoes were also putting off from the two villages. As the first canoe neared us, we threw over some bottles to them, but they did not pay any attention to them. We again tried them with Erroob words, and, I think, they understood "toorree" (iron), and answered to us, "nipa" (a knife). We held up hatchets, and again said "toorree," when they, I believe, repeated "nipa," and seemed to apply the word to the hatchet, as if it were a foreign word they had heard, but did not know the exact meaning of. They certainly never used the word "sapăra," which is the Erroobian word for hatchet. As we could not induce them to come alongside, we fastened a hatchet to a breaker, and set it adrift. They pulled for it, but seemed cautious of approaching it, and when they did, they

poked it, and turned it over and over with their paddles, as if they feared some hidden danger. At last they espied the hatchet, which they took off, but let the breaker go, although bound with iron hoops. They passed the hatchet from one to the other, and examined it, and at last seemed clearly to comprehend its use, as they set up a shout, and waved it aloft in the air to the other canoes coming up. Its possession, however, instead of inducing them to commence a peaceful trade, seemed only to excite them instantly to attack people having such valuable articles. They paddled towards us instantly, cast loose their arrows, adjusted their bows, and very shortly began to shoot at us. Captain Blackwood then fired his rifle into the end of the canoe, which seemed to alarm them a little, and they hung back for the rest.

Meanwhile we were going rapidly down with the ebb tide, along the channel leading to the south. As soon as we opened the mouth of this channel we met a breeze from the sea, obliging us to beat. We found from two to three fathoms water, which was deepest near the bank: as we proceeded, however, it got shoaler, and at the mouth of the channel we got into eleven feet, the same water we drew, and as the tide was falling, we were obliged to return and anchor where it was deeper. We sent the cutter on to try for a deeper channel outside.

Just within the extreme point of the west bank, near which we lay, was a large village, concealed among the trees, having one or two great houses,

and a crowd of men, women, and children about it, wading out over the mud-flats under the bank, waving to us, and inviting us to come ashore. On a shoal of mud or sand beyond the point were twenty or thirty men wading about, apparently catching either fish or molluscous animals, and beyond them, out at sea, we now saw three large canoes, full of men, who, as soon as they perceived us, came towards us at full speed. The cutter returned to us under sail, before a fresh breeze, and with all her oars out; notwithstanding which, these canoes, by the help of their paddles alone, stemmed the force of the adverse tide, and gained so rapidly on our boat that they would have cut her off had she had another mile or two to go. The canoes were simply large hollow trees, without any outriggers or other external support; they were round-bottomed, the ends rising gently from the water, but not closed, and at the bow of each sat a man, with his back to the sea, apparently for the purpose of keeping the water out. Each of these canoes had full forty men in it, as we counted in one fifteen paddling on each side, and there were others standing idle. The paddlers stood pretty close together, at regular intervals, and kept excellent time in their stroke, having a long paddle with a diamond-shaped blade. There was no one steering, but as the paddlers stand and look forward, they can of course steer themselves. Along the outside of the canoes we could see a carved line running in curves, apparently as an ornament. They first

pulled into the village, and seemed to be landing their cargo, apparently fish, and taking in an armament of bows and arrows and other weapons, changing also part of their crews, probably fishermen for warriors. There was much shouting and hurrying to and fro among them; and as every thing portended a hostile movement, and there were fully 200 fighting men among them, and as many more within a mile or two, Captain Blackwood ordered the six-pounders to be loaded with round and grape, and all hands on deck with loaded arms, and crouched behind the low bulwarks of the Prince George, the cutter being ready under her lee to act as occasion might require. As soon as the first canoe was ready, they pulled up inshore, with about thirty men in it, and then shoving off into the stream, they drifted down upon us with the tide, passing within about fifty yards, shouting, pointing to the shore, and laughing and using words we did not understand. I thought once, however, they used the word Dowar, one of the places named to us by the Erroobians as existing in New Guinea. Several in each canoe held their bows and arrows ready in their hands, while the rest steered, with their weapons lying at their feet. All of them had the cane loop and bamboo scoop hanging over the shoulder, and were ornamented with shield-shaped pieces of shell over the groin, and round ones on the breast, and with bracelets and armlets. Several of them had large red flowers stuck in the hair, and one had two large

tufts of feathers, like those of the emu or cassowary, on each side of his head. When the tide had drifted them past us, they pulled into the village. Four canoes repeated this manœuvre, to each of which we exhibited axes, and used all the terms and gestures of peace we could think of, but could not induce them to come closer to us, and they answered us by laughter, and invitations to go ashore, which we were equally disinclined to accept. Their tones and gestures were frequently those of derision; and once as I was talking very earnestly to one canoe, one of its crew presented his bow at me, and drew the arrow to the head, and on my stooping and picking up my gun, he burst into a laugh, as if mocking me for shrinking. Still, as they committed no overt act of hostility, of course we did not, and after they had apparently satisfied their curiosity by a near view of us, they all went ashore, and seemed to turn their attention to collecting shell-fish or other animals from the mud at low water.

We could distinctly perceive to-day that none of them had any scars or marks on the skin, but several were smeared or painted with black or yellow ochre. Some had a close crop of hair, others rather long curls, like the Erroobians. We saw several women ashore, mostly middle-aged, with the breasts flat, pendulous and dug-like, and these seemed perfectly naked. One or two younger ones, however, appeared to have a kind of belt round the loins, and something like a leaf, about as broad as the hand, drawn between the legs.

There was a grove of cocoa-nuts round the village, and much sago-palm and other trees, among which was the bread-fruit: although so near the sea, there were but few mangroves.

As the water outside this branch seemed too shoal for us, it was decided we should return by the way we came in; accordingly, at half-past three, when the flood tide made, we weighed, and went rapidly up with it and a favourable breeze. We got pretty close to a canoe with six men, under the western bank, whom we induced to pick up some bottles we threw to them, and at length to come near enough to us to take a hatchet from the gig that was towing astern, and which Dr. Whipple went to give them in exchange for a cocoa-nut. During this they seemed, however, in great trepidation, and their faces assumed a most amusing expression (or caricature rather) of great horror and disgust at finding themselves so close to such hideous white people.

When we opened the south-west channel, we saw eleven more canoes coming off to us from the two villages in that direction, of all sizes, from those holding one man to those that had twenty or more, and a crowd of people launching others. We did not stop for them, however, but made the most of our fair wind and tide during the fading light.

Arrived at the entrance of the Pigville channel, we got aground on a steep bank of eight feet only, but towed off with the rising tide, and anchored in the centre of the stream. At ten at night the tide

turned; and the ebb being now favourable for us, we passed the bar at the top of high water, and beat down below Pigville, when we anchored.

June 1.—It was still raining, with a constant drizzle and heavy showers at intervals. We weighed at nine o'clock with the first of the ebb, and beat down, making boards right across the river from bank to bank, and finding everywhere a depth of full three fathoms at high water. We tacked close in to the village next below Pigville, where we counted four immense houses and several smaller ones. There were many people, both at the edge of the water and in front of the houses, mostly armed, but they ran out with shouts rather of welcome than defiance, holding up branches of trees and shell ornaments, inviting us ashore. Having learnt our power, I have no doubt we could have now commenced a friendly intercourse with these people, could we have stayed a day with them. The weather was too wet, however, and the jungle too thick and close to venture ourselves ashore, when our arms, if wanted, might be useless; and as, from a careful survey with our glasses, no sign of our boats, or of any European articles, could be seen, it was decided we should make all possible use of the present favourable tide to quit the river, and return to our ship. We accordingly beat down out of the channel on to the mud-flats outside. Here we found a fresh sea-breeze springing up, which, with our weather tide, enabled us to work rapidly to windward, making

boards of about four miles in length, and every where finding a perfectly level bottom of about two fathoms depth for about eight miles from the mouth of the inlet. The depth then gradually increased to three fathoms and a half at dead low water, when the flood-tide setting against us, we anchored at three in the afternoon. We were now in sight of the ship, about eight miles to windward. The weather was clear and fine, though a bank of dark clouds still hovered over the land.

At nine at night we weighed again, with the ebb tide, and anchored near the ship at two in the morning.

June 2.—We had but just come out in time. There was now a strong breeze blowing from the S.E., with a very heavy sea rolling in upon us, that made it a matter of some difficulty to get on board the ship. The mud-flats to leeward must now have been covered with breaking water and rollers, that would have compelled us to remain in the rivers till the breeze subsided and the sea went down; and it blew hard for the next ten days after this.

They had had cloudy weather with light winds on board the ship during our absence, but not a drop of rain; while we had been in a perpetual torrent in the rivers and among the woods, not more than thirty miles distant from them. This fact, with others, makes me believe that the climate of New Guinea, or the north side of Torres Strait, is totally different from that of Australia on the south; that New Guinea has not only a much

moister climate altogether, but that the character of the seasons is reversed; the S.E. monsoon being a wet season and the N.W. a dry one.

We had now examined, more or less closely, about 140 miles of the coast of New Guinea, being just that part also which was most dangerously situated, most exposed to the prevailing winds, and to the swell of the open sea. From the large opening or river mouth in S. lat. 8° 45′, E. long. 143° 35′, to the farthest point examined in the boats in lat. 7° 40′, and long. 144° 30′, and for an unknown distance beyond that point, the coast had every where the same features. It was low, flat, muddy, covered with jungle and impenetrable forests, and intersected in every direction by a multitude of fresh-water arms and channels, uniting one with the other, and forming a complete net-work of fresh-water canals of all sizes and depths, from a mere muddy ditch to a width of five miles, and a depth of twenty to thirty feet. This coast was fronted by immense mud-banks, stretching from ten to twenty miles out to sea, having at low water a general depth of about twelve feet, and a few deeper places, and some sand-banks much shoaler or quite dry. These mud flats gradually deepened towards their outer edge to three and four fathoms, and then more rapidly to six, ten, fifteen, and twenty fathoms.

Now this is precisely the formation of the delta of a great river, and the only difficulty in the present case is the supposing a river large enough to produce

such a delta to exist on an island like New Guinea.

From what we know of the rest of the island, however, the existence of such a river becomes highly probable. A range of high mountainous land runs along all the north coast from Dampier's Strait to Geelvink Bay. High land also comes out upon the south-west coast about Triton Bay, where the Dutch once formed a settlement near the 137th meridian. The hollow between these two ranges would run towards the south-east, in which direction of course their drainage would be deflected. We have already seen reason to believe that the country is a wet one; and the moisture, which does not fall as rain from the south-east trade-wind as it passes over the flat land, is no doubt caught and precipitated in abundance on the south-east sides of the mountains, and is thus sent down on to the flat, in the shape of rivers. Whether these ever join into one stream, or whether a number of them all run for the south-east coast, and thus unite only in forming the delta of which we traversed the outer edge, is, of course, left open to conjecture. If they ever unite in one stream, it will probably be found to be a very noble one for the size of the island, winding perhaps through rich flats of tropical forests. Whatever be the characters of the interior waters, however, they must afford access for small craft into the very heart of the country. Unlike the rivers of Australia, the estuaries of which are always

salt, and the rivers mostly trickling shallow streams, running over rocks or sands, the rivers of New Guinea are so full, and abounding with fresh water, as to influence the sea for miles outside their mouths, and expel the salt-water even from the flattest and most sluggish part of their course. Any craft, then, that can get across the mud-flats off their mouths, need never fear the being unable to find water enough for many miles above them. No doubt some channels will be much more shoal than others, but a small light steamer, drawing about six feet of water, might probably penetrate for a couple of hundred miles, or into the very heart of the country. We had no means of judging which would be the best channel to take, except that the large southern arm (in lat. 8° 45′), which Captain Blackwood first visited, seemed both the largest, and to have the deepest water at its mouth. I know of no part of the world, the exploration of which is so flattering to the imagination, so likely to be fruitful in interesting results, whether to the naturalist, the ethnologist, or the geographer, and altogether so well calculated to gratify the enlightened curiosity of an adventurous explorer, as the interior of New Guinea. New Guinea! the very mention of being taken into the interior of New Guinea sounds like being allowed to visit some of the enchanted regions of the "Arabian Nights," so dim an atmosphere of obscurity rests at present on the wonders it probably conceals.

CHAPTER XII.

LAST VISIT TO ERROOB—SEEWAI GIVES US NEWS OF OUR MISSING BOATS—RETURN TO CAPE YORK FOR WATER—FIND INTELLIGENCE OF OUR MISSING BOATS AT THE POST-OFFICE AT BOOBY ISLAND—THEY HAVE GONE TO PORT ESSINGTON—TWO WRECKS HAPPENED RECENTLY, OF WHICH THE CREWS AND PASSENGERS ARE LIKEWISE GONE TO PORT ESSINGTON—NOTES ON THE IMPORTANCE OF A POST IN TORRES STRAIT.

June 3.— After a rapid beating passage against a fresh breeze and heavy sea, we anchored at half-past three, P.M., in Treacherous Bay, Erroob, in order to "get sights" for the chronometer, and measure the meridian distance between it and Cape York. A party of us landed and went to Keriam, where we were met by Keouck and one or two more, who begged us to walk on to Maedha, where they said the rest were assembled. There were one or two strangers also, who were said to come from Tood Island. Keouck eagerly inquired about our adventures in Dowdee, and seemed greatly delighted when I told him we had been obliged to shoot some of the people. Arrived at Maedha, we found ten or twelve large canoes drawn up on the beach, and a large party of men and women from Tood and Damood, and other islands to the westward, on a visit to Erroob. There were several new temporary huts and sheds built, under which they were sitting

in groups. The Erroobians sprang forward to receive us with shouts of delight; and two of my *fair* friends, Moggoora and Boodha, instantly ran to take me by the arms, a proceeding that greatly astonished some of the strangers when we walked up to them. An old Tood lady I thought would never cease her exclamations of wai! wai! wah! wah! wah! at what I have no doubt appeared to her such a very extraordinary method of walking together. Seewai came up to me so ornamented with streaks of red paint, that I did not recognise him, at which he was half affronted. He soon engrossed my attention however, by telling me as well as he could, that our two boats were not in Dowdee, but had been seen passing the islands of Damood and Tood and going to the southward. He brought a Tood man, who said his name was Neipa, and who confirmed this account, saying, the boats had passed in a friendly manner by his island.* I tried to learn from them how long it was since they had been seen, but could find in our vocabulary no words answering to "how long," or "how many;" and after ringing the changes on days "gegger," sleeps "hoota," moon "maber," I failed in making them understand. I was satisfied, however, from the

* Seewai's words were "Kabbi shippo naes, lola Dowdee,—Tām kabbi shippo—kabbi shippo nerroot,—Damood, Tood." Literally, "little ship two, not Dowdee.—Tam (Millery's) little ship,—little ship another, Damood, Tood," waving his hand to the southward. The Tood man anxiously added, "Kabbi shippo poud Tood," "little ships peace Tood."

earnestness of Seewai that the information was correct, and so it afterwards proved. I now saw their "barreet," or bare-tailed opossum. It seemed to be the same species I had got in New Guinea, but larger and in better condition. It was kept in a large cage made of split bamboo, and seemed quite tame, but I could not induce them to part with it. In the introduction to Flinders's Voyage, one of these animals is mentioned as found in the year 1798 in a cage on one of the islands to the westward; so that it seems an old and common practice among the islanders so to keep them. Whether they have any especial reason for it, beyond their general fondness for pet creatures, I could not learn.

The next morning I landed at daylight at Keriam, and met Sapgob and some strangers. The houses here were now all closed, and the largest, in addition to boards across the door way, had a trellis work of bamboo over it, and outside there stood a tall board, cut into the profile of a man, like a sentry, standing before the door. They called this figure maddoop, which in Lewis's vocabulary is the word given for mad or drunk. They said Keriam was now "galla;" and to my farther questions about this "galla," Sapgob answered, "coskeer backiam, keimear menna," "wives go, men remain;" as if the place were now tabooed and not to be approached by the women.

At ten A.M. the observations being taken, we sailed from Erroob for the last time. The south-

east trade was blowing very strongly, and we ran rapidly round Attagor, and up between Damood and Tood. We anchored at night under Dove Island, and the next day ran to Evans' Bay, Cape York, to get some more water.

June 6 *to* 8.—We remained these three days at Evans' Bay completing our water, where we found a party of five Australians. These men were very quiet and friendly, but contrasted most unfavourably for themselves with our friends the Erroobians. It was now indeed for the first time that I became fully aware of the great difference between the two races, which is both a physical and mental one. These five men had the spare thin-legged, lanky build of all the Australian people. Their colour was of a more sooty black than the islanders, who are of a reddish or yellowish brown. The hair of these Australians, however, was like that of the European race, equally diffused, rather fine, and either straight, or commonly waving in broad open curls. Among the islanders the hair invariably grows in tufts or pencils. On the limbs and body these tufts are a little separated from each other, the skin around them being devoid of hair, but on the head the tufts appear to grow close together, and are only apparent by each twisting itself into a lock, which, when long, becomes a narrow pipe-like ringlet. When short, the hair of the head looks frizzled, but is not so woolly as that of the negro. The hair

of the head, however, is not so decisive a characteristic as that of the body, because its aspect often depends on the fashion of wearing and dressing it. In any observations, therefore, upon these people the short hair of the chest and limbs should be remarked rather than that of the head. If the people belong to the genuine frizzled-haired or Papuan race, the skin will have a slightly woolly aspect. These Australians at Cape York were much more strongly scarred than is usual with the islanders, several had the mark on the shoulder, but instead of a mere mark it stood out in high relief, and they had other strong scars on the breast, back, and abdomen.

In their intellectual qualities and dispositions they were still farther removed from the islanders, and much below those of Murray and Darnley Islands. Houseless and homeless, without gardens, or any kind of cultivation, destitute of the cocoa-nut, the bamboo, the plantain, and the yam, as of almost all useful vegetables, they pass their lives either in the search for food, or in listless indolence. Instead of associating with us on something like terms of equality, bartering with us, teaching us their words, and learning some of ours, laughing, joking, and engaging in sports, like our Erroobian friends, these Australians sat listlessly looking on, standing where we told them, fetching anything or doing anything we ordered them, with great docility indeed, but with complete want of

interest and curiosity. In our endeavours to get words from them they merely repeated our sounds or imitated our gestures. When they spoke it was difficult to catch the sound, so different was their speech from the clear open enunciation of the Erroobians. With the latter we often eat, as they were perfectly clean; but these Australians, on our shooting a kite or two, instantly seized them, plucked off some of the feathers, and then warming the body a little at the fire, tore it open and eat it up, entrails and all. These Australians at Cape York precisely resembled those of the rest of the continent, as I have myself seen them, and as they have been described by other voyagers. The Torres Strait Islanders, on the contrary, evidently belong to the great Papuan race, which extends from Timor and the adjacent islands through New Guinea, New Ireland, and New Caledonia, to the Feejee Islands.

It is singular enough, that in Torres Strait, the line of demarcation should be almost equally strong and precise between two kinds of vegetation, and two groups of the lower order of animals, as between two varieties of the human race. The dull and sombre vegetation of Australia spreads all over Cape York and the immediately adjacent islands. Wide forests of large, but ragged-stemmed gum-trees, with their almost leafless and quite shadeless branches, constitute the characteristic of this vegetation. Here and there are gullies, with jungles of more umbrageous foliage, and some palms, but the

mass of the woods are arid, hot, and dusty, the leaves not only small, but dry and brittle, and the marks of frequent fires every where apparent in calcined rocks and blackened stems and fallen trunks. On the islands of the northern side of Torres Strait, not a gum-tree is to be seen, the woods are close, lofty, and afford the deepest and most refreshing shade, often matted into impenetrable thickets, by creepers and undergrowth, but adorned with varied foliage, with the cocoa-nut, the plantain, the bamboo, and other plants, not only beautiful, but useful to man. On the New Guinea coast the vegetation is of the rankest and most luxuriant character, even for the tropics. One vast dank jungle spreads over its muddy shores, abounding in immense forest trees, whose trunks are hidden by groves of sago-palms, and myriads of other heat and moisture-loving plants.

In the animal kingdom I was struck with the difference in the general aspect and character of the shells and echinodermata collected about Cape York and those got near Erroob. The corals and coral reefs were, of course, much the same, as were the tridacna, hippopus, and other reef-burrowing or coral-inhabiting animals. But of those that live on rocks or sand-flats, we have at Cape York only dark coloured turbo, trochus, turritella, strombus, &c., while at Erroob we got bright-coloured olivas, mitres, and others. Instead of the dull cerithium, we got the splendid terebra maculata and allied forms.

Even in the same genera, as among the cones and cowries, the species found about Erroob were different from, and generally more brilliant in form and colour, than those on the Australian coast. Nay, even in the same species, as in the common Cypræa tigris, the specimens were more rich and handsome from the former place than those found about Sir C. Hardy's Island for instance. In individual specimens this difference might not, perhaps, be so observable, but if a group of the most common species of the two localities, whether of plants or animals, were taken, it became instantly apparent. It was evident that in crossing Torres Strait we were passing from the Australian centre of life, so to speak, into that of the Indian Archipelago, or more strictly, perhaps, of the Moluccas.*

In the vegetable kingdom a reason for the difference might be sought in the variation of the climate. From the abundance of fresh water, and from the habits and manners of the people —such as firewood being stored in the houses, sticks laid across the paths to keep the passenger from the mud, as well as from our personal experience while there—the south-east coast of New Guinea has evidently a very moist climate. It is probable, I think, that during the whole S.E. monsoon, or from the middle of March

* I use the term Moluccas here as the common one; but it is highly probable, I think, that the peculiar species of animals and plants inhabiting the Molucca Group have New Guinea for their head-quarters.

to the end of October, the weather is rainy, and that during the N.W. monsoon, which brings rain to the north coast of Australia, the south coast of New Guinea may have its dry season. Australia, on the contrary, has a remarkably dry climate, and though there are frequent showers during the S.E. monsoon on the margin of the north-east coast and about Cape York, where the trade wind first strikes upon the land, it is probable that in the interior (as it is certain that on the north coast about Port Essington) no rain falls during the greater part of the year, and heavy showers only during the remainder. Not only, however, is this variation of climate not sufficient to account for the utter difference in the vegetation of the two countries, Australia and New Guinea; but I much question whether the difference in the climate be not in great part the result of that in the vegetation. The thick dank woods and jungles of New Guinea completely protect the soil from the sun, the broad close leaves shelter even the stems of the trees, and all tend to produce a coolness favourable to the precipitation of moisture from the damp trade wind. The open and scattered woodlands of Australia, on the contrary, offer no shelter to the ground from the rays of the sun. The small, thinly-disseminated leaves of these evergreen trees, instead of giving shade, become themselves as hot and parched as the rocks and sands beneath them. The ragged strips of dry and resinous bark hanging from the trunks of all the trees, are like tinder, ever ready to catch fire with a

spark, and the grass among the trees commonly resembles hay. Everything absorbs the heat freely, and radiates it into the surrounding atmosphere. Instead of being cooled then, and precipitating its superabundant moisture, the sea air, on entering an Australian wood, has its temperature raised, and becomes capable of licking up any drop of humidity it may find still lingering there. For this reason, a current of air is seldom perceptible in an Australian forest, which always feels hot, dry and oppressive. The immediate neighbourhood of Cape York indeed seemed one of the comparatively favoured spots, where frequent showers during the whole year permitted the existence of permanent fresh water pools and green grass during even the driest season.

Whether or not the differences in the vegetation and the climate of the neighbouring parts of the two countries can be in any way dependent on each other, it is evident that no alteration of temperature or other conditions can have place in the sea, sufficient to account for the change that takes place in its inhabitants. It will be seen, however, in the next chapter, that one of the corollaries deducible from a speculation regarding the origin of the coral reefs, is the probability of the assemblage in Torres Strait of two groups of marine animals arriving from opposite directions.

June 2, 1845.—The Prince George had been despatched to Booby Island for intelligence, and we this morning weighed and followed her, bidding a

final adieu to Cape York and Torres Strait. On nearing Booby Island, we saw the appointed signal for good news flying, and found that our boats, having missed us on the coast of New Guinea, after a vain attempt to reach Caedha, or Bramble Key, had run for this little islet. We had left provisions here in the early part of the year for any ship-wrecked people that might come in their boats. Availing themselves of these, and procuring a fresh supply of water near Port Lihou, in Endeavour Strait, our people had left the second gig on Booby Island, and gone on in the Midge to Port Essington. We also found intelligence that two large vessels had been wrecked—one the Hyderabad, in the Cumberland Passage, near Murray Island, another the Coringa Packet, on some outside reefs to the northward, about S. lat. 17°, and E. long. 150°. The crews and passengers of these, consisting altogether of seventy or eighty people, had also visited Booby Island, and gone on to Port Essington, partly in their boats and partly in a small schooner that happened to pass by. Among the passengers by the Hyderabad were some ladies from Van Diemen's Land, on their way to India, whose acquaintance we had had the pleasure of making when in Hobarton.

The mention of these circumstances leads me naturally to enter on a subject which I believe an important one, namely, the propriety of establishing a post in Torres Strait, somewhat similar to that

which has been formed at Port Essington. The reader, perhaps, will hardly be able fully to perceive the bearings of the case until he has read the two following chapters; but I will here briefly give my reasons for proposing such an establishment. Any one who casts his eye over the chart attached to this work will perceive that all vessels passing through Torres Strait will be compelled to come within sight of Cape York. Most vessels come up along shore from the southward, and go either through Endeavour Strait or the Wednesday Island Passage, when they must, of course, pass within a mile or two of the Cape. Even, however, if they enter Torres Strait by Bligh's Entrance, between Anchor Key and Bramble Key, the wide-spread mass of reefs that stretch off the south coast of New Guinea will compel them to keep to the southward, either to Wednesday Island or the entrance of Endeavour Strait. Since the survey of these latter straits they have been shewn to be by far the best exit from Torres Strait to the westward, and the only one to be recommended to large vessels. If, therefore, a post were established either at Cape York, or near the entrance of Endeavour Strait, a communication might be had with all shipping passing through, without causing them any detention, or deflecting them from their route a single yard. Now, as the entire trade of the South Pacific, with the whole of the Indian Ocean, must pass through Torres Strait, as the shortest and most

practicable* route, this facility of communication alone would be an immense advantage to that great and increasing commerce.

However complete and accurate may be the surveys of Torres Strait and the Coral Sea (that lying off the north-east coast of Australia), it must always remain a dangerous navigation. Slight accidents, such as hazy weather, mistakes in the reckoning, unknown errors in the chronometer or sextant, or want of completeness or soundness in the rigging or finding of the vessel (to say nothing of carelessness and incapacity in the navigator), will always cause a pretty high average of wrecks in the vessels passing through Torres Strait. In the greatest

* To persons unacquainted with this region of the world, it may not seem obvious why almost the only route from the South Pacific to the Indian Ocean is through Torres Strait. The reason is simply this, that the S.E. trade-wind blows directly for the Strait almost all the year round, within the tropics, and during the summer, or from November to March, S.E. is the prevailing wind over a large part of the extra-tropical sea. Along the south coast of Australia the winds are almost as constantly from the westward, most frequently S.W. In order to pass then from the Pacific to the Indian Ocean by that route, contrary winds will have to be contended against, and hardly one passage would be effected without a heavy S.W. gale before Cape Leewin was fairly weathered. If, again, the voyager determined to go round north of New Guinea he would have to take a circuitous route, little known, where charts and sailing directions would alike fail him, and have to thread his way through a multitude of dangers equally great, if not more so, as being less known, with those which will obstruct him in Torres Strait.

number of these cases, if not in all, the vessel will merely be stuck upon a coral reef, with ample time to save the lives of the crew and passengers in the boats. These circumstances are of annual occurrence. At the present time the nearest points of refuge for these boats are Port Essington, 600 miles beyond Cape York, or Coupang in Timor, 500 or 600 miles still further to the westward. The land about Port Essington is so low and difficult to make out, that it may easily be missed or passed in the night, and when once passed cannot be regained against the wind, in a crowded and perhaps crazy boat. Many poor fellows, after undergoing great hardship, have thus been compelled to throw themselves on the hospitality of the small Dutch settlement at Coupang. Now a post at Cape York, or the neighbourhood, would not only render these long and perilous passages needless for a crew thus situated, but in many cases it would be able to send assistance to the wreck, if the boats could not contain all on board, or would be able to save some of the more valuable part of the cargo or ship's stores. Neither would the wrecked crews or passengers suffer much detention, as in a few days they might be forwarded by a passing vessel to some port in the East Indies, such as Singapore, for instance.

To these two great advantages, facility of intercommunication and speedy and effectual aid in case of shipwreck, many minor ones might be added, such as the supplying of stores, provisions, gear

or tackling, and above all, of *water* to the vessels passing by.

In a military point of view such a post would be most valuable, and its importance is daily increasing with the augmentation of the commerce passing by this route. If a war were suddenly to break out, a small vessel belonging to an enemy would, by occupying the sea near Cape York, command the whole of our commerce between the South Pacific and the Indian Oceans. By stationing a look-out post on Mount Adolphus, she might be advertised by signals of the approach of all vessels, and of their number and character, and by making herself thoroughly acquainted with the neighbouring reefs and shoals, might easily pick out tortuous and dangerous channels, which would afford her refuge and means of escape from a force superior in strength to herself. The existence of a military post in Torres Strait would deter a small vessel from occupying this station, as defences might easily be thrown up for its protection against any force she could land to attack it; while, for a large vessel, the object would hardly be of sufficient importance, and it would be more difficult for her to reach the ground without being observed and followed by one of our own.

As far as regards the comfort and well-being of the party inhabiting the place, I can only say, that in climate and pleasantness of aspect, the neighbourhood of Cape York is vastly superior to Port Essington. The soil of both is equally barren, but the

constant fresh breeze at Cape York and the frequent showers produce a greenness and freshness in the grass and vegetation even in June, when at Port Essington every green thing is turned to brown. If the post were stationed in Evans' Bay, high dry rocky places might be selected for the houses, easily defensible, and exposed to the full draught of the sea-breeze, and overlooking a strip of rich garden ground between them and the sea; close on one side are several hundred acres of good grass land, leading to some fresh water pools, and environed by some steep rocky hills, about 300 feet in height, which are covered by an almost impenetrable thicket, forming a natural fence. On this grass land the cattle and horses for immediate use would be kept. On the other side is Bremer Peak, 500 feet in height, where the signal-post would be within sight to give notice of the approach of vessels. A beautiful sandy beach, two miles long would be in front of the garden, on which it would be perfectly safe to bathe at all times of the tide without fear of sharks or alligators. In addition to these means of health and support, might be mentioned the frequent and comparatively rapid communication with the rest of the world, and the excitement of passing intercourse with strangers, so cheering to the spirits of a small and isolated party. Even the varied scenery of the hills and islands around would not be without its beneficial effect on the health and minds of the residents; as I believe, on the contrary,

the dreary monotony of Port Essington has had its evil influence on those stationed there. As far as my own personal feeling goes, if I were condemned to either, I would rather live at Cape York for five years than at Port Essington for two.

One objection might be raised by a person unacquainted with the place, which is, that there is no harbour there. In the sense of a small space of sea having anchorage, and almost surrounded by continuous land, this is perfectly true, but the fact is, such a harbour is not needed. The sea is perfectly smooth. No ground swell ever penetrates into Torres Strait, at all, so defended is it by the coral reefs. During the season, when vessels are passing, the wind is always S.E., from which the land about Cape York shelters the anchorage. During the N.W. monsoon, anchorage may be found at the entrance of Endeavour Strait, perfectly sheltered from all N.W. winds. The post might be situated thereabouts if water should be found, and sufficient grass land and garden ground.

There is another set of arguments on which I have not touched, because they would be based on what as yet has no existence, steam communication between India and New South Wales. When this is brought into operation, it appears to me that Cape York must necessarily be one of the coal stations. It is by far the most convenient place I know for such a purpose in these seas, as I have no doubt a wooden pier could be run out from a rocky

point on the eastward of Evans' Bay, with water of sufficient depth for the vessel to lie alongside. It appears important likewise to diminish the distance as much as possible, between the last coaling-place and Port Jackson. The distance from Cape York to Port Jackson is 1700 miles; but, from the intricate nature of the navigation south of Cape York, the steamer would be delayed for a longer time than is proportionate to the mere length of the track. She would have to anchor for one night, even if she took the outside passage, while, if she took the inside route, which is generally most favourable for steam navigation, she would probably have to remain at anchor every night for the three first nights after leaving Cape York. She would likewise require to proceed slowly during great part of the day, and whenever the sun came ahead of her, would have to stop till it had passed, and the glare on the water had faded, so that the passages between the reefs should be seen.

I have put these arguments in their plainest and most unpretending light; each observation is a perfectly practicable one, and applicable to the present state of things.

I will not conceal from the reader, however, that I should augur for a settlement at Cape York a future destiny of a higher and more important character than would result from any of those considerations I have mentioned as reasons for its present existence. The time must ultimately come, when

that great chain of islands, stretching from the east end of New Guinea to New Caledonia, shall be brought within the region of civilization and commerce; when the veil that rests upon New Guinea itself shall be raised, and when the Moluccas shall be freed from the trammels in which they have hitherto been bound. Torres Strait will then be the channel of the commerce between these regions, as well as between the more remote and mighty ones which lie beyond them. It will resemble the Straits of Malacca in this respect, and another Singapore may be expected to rise on its borders, just where the converging streams of commerce are compressed into the narrowest and closest channel. This must be somewhere about Cape York, or the entrance of Endeavour Strait. It is here, indeed, if any where, that the true analogy is to be sought for, between Singapore and any point of Australia; the narrow strait, where, from physical necessity, the wide spread commerce of neighbouring seas must inevitably converge; the pass, through which one of the great highways of the world must necessarily run.*

* The present necessity for a port in Torres Strait is so obvious, as to have struck every one acquainted with it. See Mr. M'Kenzie on steam from Singapore to Sidney, in the Nautical Magazine for February, 1847.

CHAPTER XIII.

EXTENT OF THE BARRIER REEFS—THE INNER AND OUTER ROUTES—GENERAL FEATURES OF AN "INDIVIDUAL CORAL REEF"—MODES IN WHICH THESE REEFS ARE GROUPED—THE REEFS OF THE GREAT BARRIER DIVIDED INTO THREE KINDS:—FIRST, LINEAR OR BARRIER REEFS; SECOND, DETACHED REEFS; THIRD, INNER REEFS—FORM AND EXTENT OF THE GREAT BARRIER REEFS—LIKENESS TO A SUBMARINE FORTIFICATION — NORMAL FORM OF THE GREAT REEF-MASS—VARIATIONS FROM THAT FORM—THE CORAL CONGLOMERATE AND PUMICE PEBBLES OF THE NORTH-EAST COAST OF AUSTRALIA—STRUCTURE OF RAINE'S ISLET—SINGULAR MASS OF POINTS ABOVE HIGH-WATER MARK—ALL PROVE STATIONARY CONDITION OF NORTH-EAST COAST FOR LONG PERIOD OF TIME—MR. DARWIN'S THEORY APPLIED TO THE GREAT BARRIER—EXPLANATION THROUGH IT OF BOTH THE GENERAL FORM, THE NORMAL CONDITION, AND THE OCCASIONAL EXCEPTIONS AND VARIATIONS.

I SHALL, in this chapter, give a general sketch of the structure of the Great Barrier reef, as far as it was known at the close of our survey in the year 1845. It may be said to commence with Breaksea Spit, in S. lat. 24° 30′, E. long. 153° 20′, and extend to Bristow Island, on the coast of New Guinea, in S. lat. 9° 15′, and E. long. 143° 20′. This would give, in a straight line, a distance of about 1100 geographical miles, or about 1260 statute miles. It

stretches along the coast at a mean distance of about 30 miles from the land; its outer edge being sometimes not more than 10 or 15, at others, more than 100 miles distant from it. The whole of the sea which lies outside the Barrier, between New Caledonia and Torres Strait, is likewise encumbered with detached reefs of greater or less magnitude. From this large development of coral reefs this sea was called by Flinders the Coral Sea, a name which it well deserves. I have already said that the whole commerce, from the eastern colonies of Australia, and the southern Pacific, to the coasts of India and the Indian archipelago, is almost compelled to traverse this sea, and to pass through Torres Strait. Now, in order to traverse the Coral Sea and Torres Strait with any degree of safety, there are two tracks, which are commonly known by the names of the Inner and Outer Routes. In taking the inner passage vessels enter the Barrier reef at its southern extremity, and run up to the northward along shore, between the reefs and the land. This route was surveyed by Captain King: although often narrow and intricate, it is safe, because there is good anchorage the whole of the way, and the reefs themselves are a perfect shelter from the violence of the sea. The outer route has never yet been regularly surveyed, but is known roughly from its having been traversed by whalers and merchant vessels. Commencing in the parallel of 25° S. lat., it runs due north between the meri-

dians of 156° and 157° E. long., till it attains the lat. of 20° S. From this point it runs to the N.W. till it reaches 15° S. lat. and 150° or 152° E. long., and then W.N.W. to the lat. 12° in about 144° E. long. Along this route there is a clear track, from 60 to 100 miles in width, that is free from reefs.* But outside of it, on either hand, detached reefs are known to be numerous, and there probably exist many which are unknown. In this outer route the sea is of great and almost unfathomable depth as far as is known; there is consequently no anchorage, and whatever the circumstances, a ship must keep under sail till she come up to the edge of the Great Barrier, and pass through one of its openings into the comparatively shallow and sheltered water inside of it. One of the principal objects of our expedition, was to survey the northern part of the Barrier reef, so as to lay down the best openings, and to erect some mark or beacon by which one at least of them could be distinguished from the others. By means of this beacon, any vessel pursuing the outer route, that from bad weather or other causes was out in her reckoning, would have a chance of learning her true position, and which way she ought to proceed. As we never saw any of the outside reefs, I shall not attempt to describe them, but confine myself to an account of the Great Barrier.

* Mr. Evans, master of H. M. S. Fly, was kind enough to give me this information, from a number of documents collected and compiled by himself.

Although I have before had occasion to describe some of the coral reefs as individual things, yet it may facilitate the understanding them if I recapitulate their most remarkable and striking peculiarities. The size and form of an "individual coral reef" is perfectly indeterminate; it may be circular, oval, or linear; its surface may vary from a mere point to an area of many square miles. Those, however, which occupy the extreme edge of a mass of reefs,* or rise on one side from great depths, having on the other comparatively shallow water, have generally a linear form, being three, five or ten miles long, and varying in breadth from one or two hundred yards to perhaps a mile. This seems more especially to be the case when their direction runs across that of the prevailing wind. The individual coral reefs which rise from an equal depth all round, whether that depth be great or small, are more commonly of an oval, circular, or irregular shape, but these are usually much larger when exposed to the wind and surf than in more sheltered situations.

To get an idea of the nature and structure of an individual coral reef, let the reader fancy to himself a great submarine mound of rock, composed of the fragments and detritus of corals and shells, com-

* There is a term wanted to express the distinction between an individual reef, unbroken by any deep water-channel, and a group of such reefs. For the latter I am almost tempted to use the word "reefery;" for the former I have, in this passage, used the expression, "individual coral reef."

pacted together into a soft spongy sort of stone. The greater part of the surface of this mound is quite flat and near the level of low water. At its edges it is commonly a little rounded off, or slopes gradually down to a depth of two, three, or four fathoms, and then pitches suddenly down with a very rapid slope into deep water, 20 or 200 fathoms, as the case may be. The surface of this reef, when exposed, looks like a great flat of sandstone with a few loose slabs lying about, or here and there an accumulation of dead broken coral branches, or a bank of dazzling white sand. It is, however, chequered with holes and hollows more or less deep, in which small living corals are growing; or has, perhaps, a large portion that is always covered by two or three feet of water at the lowest tides, and here are fields of corals, either clumps of branching madrepores, or round stools and blocks of mæandrina and astræa, both dead and living. Proceeding from this central flat towards the edge, living corals become more and more abundant. As we get towards the windward side, we of course encounter the surf of the breakers long before we can reach the extreme verge of the reef, and among these breakers we see immense blocks, often two or three yards (and sometimes much more) in diameter, lying loose upon the reef. These are sometimes within reach by a little wading; and though in some instances they are found to consist of several kinds of corals matted together, they are more often found to be large in-

dividual masses of species, which are either not found elsewhere, and consequently never seen alive,* or which greatly surpass their brethren on other parts of the reef in size and importance. If we approach the lee edge of the reef, either by wading or in a boat, we find it covered with living corals, commonly mæandrina, astræa, and madrepore, in about equal abundance, all glowing with rich colours, bristling with branches, or studded with great knobs and blocks. When the edge of the reef is very steep, it has sometimes overhanging ledges, and is generally indented by narrow winding channels and deep holes, leading into dark hollows and cavities where nothing can be seen. When the slope is more gentle, the great groups of living corals and intervening spaces of white sand can be still discerned through the clear water to a depth of forty or fifty feet, beyond which the water recovers its usual deep blue. A coral reef, therefore, is a mass of brute matter, living only at its outer surface, and chiefly on its lateral slopes. It is believed that coral animals cannot live at a great depth; that twenty, or at the most thirty fathoms is their extreme limit of growth. This is apparently proved, or nearly so, with respect to all *known* species of

* I have seen a block of mæandrina, of irregular shape, twelve or fifteen feet in diameter, the furrows of which, though much worn and nearly obliterated, were wider than my three fingers; also very large blocks and crags of a porites, twenty feet long and ten feet high, but all one connected mass, without any breaks in its growth.

coral that form reefs, all those found in the hollows or on the sheltered slopes of reefs, where alone they can be examined. Whether it be universally true, for all polyps depositing large masses of calcareous matter, will perhaps admit of a doubt.

These individual coral reefs are grouped together in various ways, forming "atolls," "barriers," and "fringing reefs," as described by Mr. Darwin. The Great Barrier Reef of Australia is itself composed of each of these different kinds of groups, which I shall class as 1st—"The linear reefs," forming the outer edge, or actual Barrier. 2nd—"Detached reefs," lying outside that Barrier. 3rd.—"Inner reefs," or those which lie between the Barrier and the shore. The 1st, or linear reefs, are generally long and narrow, running along a line more or less parallel with the shore, and divided from each other by narrow passages. They vary from 200 yards to a mile in width, and from half a mile to ten or fifteen miles in length. They have commonly unfathomable, or at least unfathomed, water on the outside, and a depth of from ten to twenty fathoms on the inside of them. The 2nd or "Detached reefs," are not common near the Barrier, and occur only in one neighbourhood. They rise from deep water all round, have more or less of a circular form with lagoons inside them, and are regular "atolls" on a small scale. The 3rd or "Inner reefs," are very numerous. They are scattered over the space between the Barrier and the

land, sometimes occupying the greater part of the intermediate space, sometimes leaving a comparatively clear channel on one or both sides of them; that is between themselves and the Barrier, and between themselves and the land. They have no peculiarity of form, are perhaps most commonly steep-sided, but not unfrequently have a gradual slope.

We will now commence at Sandy Cape, and trace the reefs to the northward, into Torres Strait. From the pitch of that Cape a narrow sandy shoal runs out to the northward, which appears to become partially covered with coral as it proceeds. It is about twenty miles long, and was called by Cook Breaksea Spit. From Sandy Cape, a bank of soundings is found, running along the east side of Breaksea Spit, and continuing from it to the northwest. This bank of soundings has from ten to twenty fathoms' depth upon it, but it slopes towards its outer edge down to thirty fathoms, and then suddenly pitches down into deep water. The edge of this bank runs from a little outside Breaksea Spit, first in a N.W. direction to lat. 23° 30′, and then in a N.N.W. direction to 23° 12′. It appears to consist entirely of sand, which, immediately north of the end of Breaksea Spit, was wholly siliceous, hardly a particle dissolving in muriatic acid. Thirty miles N.W. from the point of Breaksea Spit is Lady Elliot's Island, a regular coral reef, with an islet on the lee side of it. The edge of the bank of

soundings runs about three miles outside this reef and island. Twenty miles N.W. of Lady Elliot's Island is the First Bunkers Island, which is about five miles within the edge of the bank. From this a chain of islands and reefs runs to the northward, parallel to the edge of the bank; singly at first, but in a double or triple row as we proceed. This group of reefs and islets is called the Capricorn Group, and extends from 23° 55′ to 23° 10′. It consists of twenty large reefs, ten of which have each a small islet upon them. All the islets, except One Tree Island, are near the leeward edge of the reef. The islets are of an oval or circular form, and their longest diameters often run in the same direction with the longest diameter of the reefs. This is most usually nearly east and west; the reefs, as also the islands, being often, but not invariably, longer in that direction than from north to south, in the proportion of five to two. The islands are composed of a base of coral conglomerate, partially covered with loose sand. The reefs have sometimes a shallow lagoon in the centre; the islands, also, often consist of a ring-formed bank of sand, with a flat hollow in the centre. There is never more than one islet on each reef, and that is wholly on one side of the lagoon, and very small, compared with the reef. From the main land to the easternmost islands, the depth increases from ten to twenty and thirty fathoms, the most usual depth being twenty fathoms. Outside the islands the bank gradually deepens for about

five miles, when it is forty fathoms and upwards, and then suddenly to two hundred fathoms, with which sometimes no bottom could be reached within a quarter of a mile of the edge of the bank. The soundings on the bank were mostly sand, with fragments of shells and corals; but instead of being wholly siliceous, as near Breaksea Spit, it was found, near the Capricorn Group, that the smallest grains were calcareous, everything brought up from the bottom being soluble in muriatic acid.

North of the parallel of 23° 10′, there is an open space of sea, in which no reefs occur, about fifty miles wide from north to south; and the bank of soundings, instead of having a steep, well defined edge, slopes out very gradually far to the eastward. The flat, of about twenty fathoms, extends out as usual from the main land for about thirty or forty miles, and then gradually deepens, till seventy, eighty, ninety, and a hundred fathoms are successively attained, twenty or thirty miles eastward of the boundary of the line of soundings, as it exists to the southward. The character of the bottom likewise changes from a coarse coral sand to the finest possible mud, of a light olive green colour, in which the lead often wholly buried itself on reaching the bottom. This, when dried, was also entirely calcareous, and wholly soluble in muriatic acid.

In lat. 22° 25′ and long. 152° 40′ commences a very strong body of reefs, the boundaries of which run towards the north and north-west respectively,

till they attain a width of about ninety miles. These are called Swain's* Reefs. The outside or eastern edge of them was traced to lat. 21°, where, from running due north and south, it seems to trend more to the north-west. The bank of soundings is still continued outside these reefs, as far as 21° 53′, in which latitude a line of soundings was run off them out to seaward, the depths being 34, 54, 65, 76, and 83 fathoms, which latter cast was obtained at a distance of fifteen miles to the eastward of the reefs. For fifty miles further north, soundings in 40 and 50 fathoms were obtained two or three miles outside the reef; but then the depths became much greater, and the bank of soundings seems not to extend outside the reefs at all. In lat. 21° 5′ no bottom was found with 80 fathoms inside a small projecting reef, and outside it no bottom with 50, 120, and 200: the latter cast was made five miles from the reefs.

At this point our examination of the southern part of the Great Barrier terminated, and so far it can hardly be said that any *true barrier* exists. There is merely a bank of soundings running to a greater or less distance off shore, with large masses of coral reef settled upon it, and within its outer boundary—almost equally large clear spaces intervening between the different groups of reefs. In

* Because first traversed by Mr. Swain, in the brig Eliza, 1798.

Swain's Reefs, the individual reefs on the outer edge of the group are scarcely to be distinguished in form from those inside them, although they may have a little more linear shape, and their greatest length run more invariably along the line of the boundary of the group. It is only at their northern extremity that they assume one of the characteristics of a true barrier, that of rising like a wall from a deep and almost fathomless sea.

The inside, or south-west boundary, of the group called Swain's Reefs, was traced to lat. 21° 50′; it left a space of fifty or sixty miles wide between it and the land, clear of reefs, and with a depth of 30 to 50 fathoms. From a little beyond this point, or north of 22°, the reefs were examined along their inner boundary by Captain Flinders, as far as lat. 18° 30′. He endeavoured, in vain, to find a passage through them out to sea in the intermediate space; and in all probability they are a wide and strong body of reefs, and their outer edge may probably run from that of Swain's Reefs through Lieut. Vine's Horse-shoe Shoal, to lat. 19°, or thereabouts. In lat. 18° 30′, Captain Flinders found a large gap in the Barrier, through which he passed out to sea. It was at least twelve miles wide, but a bank of soundings ran along it, on the edge of which he got bottom in 58 fathoms. From this gap, as far as lat. 16° 40′ (a space of about 120 miles), the form and condition of the Barrier is unknown; north of the latter point, however, it has now been

regularly surveyed by H.M.S. Fly and Bramble as far as the coast of New Guinea.

From 16° 40′ to 16° 10′, the reefs seem much broken, with but little regular barrier. The linear extension of the reefs stretches nearly east and west, and the bottom is very irregular. At one point soundings were got outside the reefs for a distance of four miles, within which space there were casts obtained of 27, 43, and 165 fathoms, the latter in blue mud, immediately beyond which was no bottom, with 321 fathoms.

From 16° 10′ to the parallel of Lizard Island, the Barrier is formed by a narrow chain of reefs running due north and south, at a distance of about thirty miles from the land. The openings or breaks in the Barrier are many, but small, rarely so much as a mile wide, while the reefs are from one to six, or even fifteen miles long, and about a quarter of a mile broad. Outside this part of the Barrier no soundings were obtained, though trials with 75 and 150 fathoms were made at one or two miles' distance. Immediately inside is an almost clear channel, of about five miles wide, running north and south parallel to the Barrier, inside of which again there are numerous inner reefs, running nearly close up to the land, and making the inshore navigation very intricate. The usual depth in the channels among these inner reefs, and between them and the Barrier, is 12 to 25 fathoms.

From the neighbourhood of Lizard Island,* the Barrier curves round to the N.W. by W., in which direction it runs till it approaches the projecting point of Cape Melville within twelve miles, when it trends round to the northward again. In the space about Cape Melville, the inner reefs are more than commonly numerous and strong, for as the outer Barrier here runs almost parallel to the direction of the trade wind, instead of across it, the sea inside is less sheltered, and the surf on the edges of the inner reefs becomes heavier than usual. This circumstance, I believe, is always favourable to the extension and increase in number of coral reefs. The inner reefs in this part are generally quite "steep to," having 10 fathoms close alongside their edge, the channels between them varying from 12 to 25 fathoms.

Outside the Barrier the depth could rarely be ascertained. It often required from 30 to 80 fathoms of line to strike bottom from a boat immediately outside the surf of the breakers. On one line, however, bearing N. by E., from Howick's Group of Islands, in long. 145° 5′, lat. 14° 15′, bottom was got with 57 fathoms at two miles, and 68 fathoms at four miles outside the reefs.

* See the chart attached to this work, which is a pretty accurate and careful reduction from our surveys, with the coast line and some other reefs added from the old charts by Captains Cook, Flinders, King, &c.

This seemed only to be a narrow ridge, or bank, and at a point bearing N. by E. from Cape Melville, just outside a small opening, and close in to the breakers, it required 135 fathoms to touch the bottom.

From the neighbourhood of Cape Melville the line of the outer Barrier runs first N.N.W. and then N. by W. for 120 miles, or to the lat. of 12° 20′, preserving a distance of about thirty miles from the main land. Throughout this space the Barrier is formed by an exceedingly narrow chain of reefs, many of which are not more than 200 or 300 yards wide, while they are from two to twelve miles long. The passages between them are generally small, but two have a width of nearly three miles, one in lat. 13° 27′ south, and another in 13° 03′.

Inside this Barrier is a clear channel between it and the inner reefs, from seven to twelve miles wide. The depth of this channel is everywhere about 15 or 20 fathoms, the bottom being almost entirely covered with broken plates of a small discoidal coral,* and of corallines belonging to the genus halimeda and others. Among the inner reefs the bottom is coarse coral sand, but inside them, in an irregular, narrow, and shoal channel between

* I suffer this to stand as it is in the text, because it gives the best popular description of these substances. I am informed, however, by Professor Forbes, that these coral-like plates are probably of vegetable origin—disks of acetabularia.

them and the shore, the bottom is fine greenish calcareous mud.

Outside the linear or boundary reefs, throughout this space, no bottom was ever reached, although 120 fathoms of line have been let go within a quarter of a mile, and 285 within less than a mile of them. They are very steep also on their inside edge, where a boat has been aground on them forward, has had a depth of two fathoms abaft, and a boat's length astern there has been from 10 to 20 fathoms.

About three miles outside the Barrier are two small detached reefs, one in lat. 12° 36′, the other in 12° 25′. They are each about a mile long and half a mile broad, and no bottom was reached anywhere around them with 120 fathoms.

Between the latitudes of 12° 20′ and 11° 20′ there is a singular departure from the usual form and character of the linear reefs. Instead of running in a straight or gently curving line, they are sharply deflected into convolutions, forming deep bays and projecting points, with large detached reefs outside. From 12° 21′ the Barrier runs off north-east for about ten miles, and forms a projecting point, on which are some large black blocks, uncovered even at high water. Beyond this point is a large open space clear of reefs, but by tracing the inner edge of this projecting point a line of soundings was found running south-west for about five miles, and then gradually curving round to the north. Near the edge of this bank are seve-

ral small patches of reef, which gradually become stronger and more connected as it trends to the north, and reassuming the barrier character, run nearly north for nine or ten miles. These are then suddenly deflected to the south-east, and run out in that direction for eight or nine miles, forming the northern boundary of the bight in the reefs, now known by the name of Wreck Bay. The mouth of this bay is six miles wide from north to south, expanding inside to twelve or thirteen; its length from east to west is about eight miles. The depth of water in this bight is very great, no bottom having been reached, except close to the reefs, and 285 fathoms, or 1,710 feet, having failed to strike bottom on its southern side, within three miles of a small reef, and four miles inside the reefs forming the entrance to the bay.

On the northern side of this deep-water bay is a curious projecting buttress of reefs, the northern boundary of the bay, after running out nine miles to the south-east, being sharply deflected to the north, and then to the north-west, so that we have a narrow loop of reefs enclosing a space of water from ten to twenty fathoms deep, ten miles long, and only two broad. After running round this loop the reefs run first N.N. , and then N.N.E., to lat. 11° 45′. Here they are again broken through, and we have only a bank of soundings twenty or thirty fathoms deep, with small detached patches of reef on it, running north for eleven

miles, or as far as 11° 34′. From this point connected reefs run out about E. by N. for ten miles, forming the northern side of Raine's Islet opening, then curving N.N.W. they are again broken in a few miles by Pandora's Entrance, after which they recover their usual linear form.

Returning now to the neighbourhood of Wreck Bay, we have Yule's detached reef, three or four miles north of the projecting loop before described. This is about three miles in diameter, and is very steep all round. It rises from an unknown depth, greater than 100 fathoms, and seems to have a deep lagoon in the centre, into which there was no entrance. Six miles N.N.E. of this commences a large detached reef of irregular outline, twelve miles long from north to south, bounded on three sides by an almost continuous mass of reef, but open on its western or leeward side, where is an irregular-shaped bank of soundings, with patches of reef upon it. Inside the lagoon of this detached reef there is a depth of 20 to 30 fathoms, but outside the reef the depth is very much greater, and generally unknown. There is a passage five miles wide between this detached reef and the line of the Barrier, in which bottom was reached in two places, once with 105 and once with 135 fathoms, fine sand being brought up on the lead. In other places ineffectual soundings were tried with 130 and 150 fathoms of line.

The northern side of this Great Detached reef

forms the southern boundary of Raine's Islet opening, which is about nine miles wide from north to south, having that Islet and its reef in its centre. The reef of Raine's Islet is a small detached one, about two miles long, from W.N.W. to E.S.E., and about a mile broad in the transverse direction. It is very steep (sloping in one place at an angle of 55°), and has deep water all round. About one mile north of Raine's Islet, bottom was reached with 160 fathoms, and with 180 about two and a half miles north-east of it. On the southern side of it no bottom was reached till close up to the breakers of the Great Detached reef, when soundings of 175 and 200 fathoms were made, bringing up fine coral sand.

From the northern side of Pandora's Entrance, in 11° 20′, the outer line of the Barrier runs in a slightly curved line, nearly due north, as far as Anchor Key, in lat. 9° 25′. For forty miles north of Pandora's Entrance, the linear reefs are very long and closely connected, with very few gaps, and those remarkably small. Beyond this, however, or N. of lat. 10° 40′, they begin to change that character, and from that point to Flinders' Entrance, in lat. 9° 40′, consist of numerous small spots and patches, very close together, so close as to afford no good entrance for shipping, but still not actually connected into one solid ridge, but forming clusters of submarine pinnacles or towers, as it were, with a depth of about 15 or 20 fathoms between them. They still preserve the form of a barrier,

however, running along a narrow band in a linear direction, with unfathomed water outside of them (160 fathoms and no bottom), and a comparatively clear space inside, having a depth of 15 or 20 fathoms. As through this space the line of reefs runs N. and N. by E., while the coast of Australia trends to N.N.W., their distance from the land is gradually increased, till, in lat. 11° 40′, in the parallel of Cape York, it amounts to eighty or ninety miles. The whole of the intermediate space has not yet been examined. There appears, however, to be a strong body of inner reefs lying a little distance off shore, between which and the Barrier the sea is comparatively clear, but with many small sunken patches of coral interspersed about, and places where the bottom is irregular. The general depth varies from 12 to 20 fathoms, the bottom being coarse coral sand, with many foraminifera and small detached corals and coral-lines, gradually passing, as we approach the land, into finer sand and detritus, and from that into the finest possible mud, wholly calcareous, and lying close in shore.

At Anchor Key, in lat. 9° 20′, long. 144° 12′, the outer Barrier terminates, no coral reef having been found to the north of it, up to the coast of New Guinea, except a small patch called Bramble Key, and that is not an independent coral reef, but a fringe round a reef of other rocks.

At this northern end of the Barrier we again

find soundings outside of it. The water gradually deepens from the 20 fathoms inside the reefs, to 40, 50, and 60 fathoms out at sea, which depths we found every where between this northern end of the Barrier and Portlock Reefs, and from the latter as far south as the parallel of Flinders' Entrance.

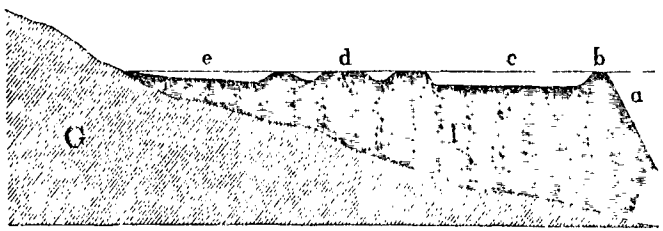
Inside the Barrier here, between Murray and Darnley Islands, the reefs are very large and numerous. A few smaller reefs also exist some miles north of Darnley Island, but with those exceptions, from Anchor Key to the westward, a clear sea is found, till we reach a very broad and persistent reef, which stretches off from Bristow Island and the coast of New Guinea, as far south as Warrior Island, a distance of thirty-five miles. This looks as if it were the northern end of the Great Barrier thrown sixty miles to the westward of its true position. A line of large reefs runs from it to the S. by W., towards the reefs which lie immediately east of Mount Adolphus Island, in a line parallel to the direction of the outer Barrier; but south of Warrior Island, these reefs are broken through by several broad clear spaces. To the westward of this last band of reefs there is a shoal sea, with a remarkable uniformity of bottom, occupying all the central parts of Torres Strait from north to south, between Cape York and Turtle-back Island. The depth is from nine to eleven fathoms, the bottom sand and mud. As far as examined by us there are no coral islands, nor coral reefs in this central band, except

narrow fringing reefs round the islands composed of other materials. These are porphyries, granites, and quartz rocks, and are an extension of the rocks of the east coast of Australia across towards New Guinea. None of these rocks are found in Murray or Darnley, or any other islands to the eastward of the line of reefs now referred to. This band, then, running north from Cape York, across Torres Strait towards New Guinea, forms a division between the Great Barrier reef and any coral reefs which may hereafter be found to the west or north-west of Torres Strait. As far as our examination extended, none such are to be found (except the very narrow *fringing* reefs round the islands), but there are many reefs laid down to the northward and westward in the old charts, which have been cursorily seen by passing navigators, and may be independent coral reefs.

The Great Barrier reefs are thus found to form a long submarine buttress, or curtain, along the north-eastern coast of Australia, rising in general precipitously from a very great depth, but resting towards the north on the shoaler ground of Torres Strait, and towards the south on the bank stretching off from Sandy Cape. If it were to be laid dry, this great Barrier would be found to have a considerable resemblance to a gigantic and irregular fortification, a steep glacis crowned with a broken parapet wall, and carried from one rising ground to another. The tower-like bastions, of projecting and detached reefs, would increase this resemblance.

From an examination of our charts, it would appear that the normal condition of this long mass of reefs is, that the outer barrier should be narrow, rising precipitously from a great depth, and running more or less nearly in a straight line, and that inside this outer barrier there should be a clear space about 20 fathoms deep and several miles wide, between which space and the land should be another body of reefs.

Diagram to represent an imaginary section of the Great Barrier reef. The proportions are enormously distorted, the perpendicular scale being fifteen or twenty times greater than the horizontal one.



a Sea outside the barrier, generally unfathomable.
b. The actual barrier.
c. Clear channel inside the barrier, generally about 15 or 20 fathoms deep.
d. The inner reefs.
e. Shoal channel between the inner reefs and the shore.
F. The great buttress of calcareous rock, formed of coral and the detritus of corals and shells.
G. The main land, formed of granites and other similar rocks.

The most remarkable deviations from this condition are in the spaces between Cape Melville and Lizard Island, and at the back of Wreck Bay and Raine's Islet. Now in each of these cases there are islands of granite or other rocks advanced from the main land, and thus causing an original irregularity in the depth of water, as it would be independent of the coral reef. This is

very remarkable in the space between 12° 20′ and 11° 30′, where we have Cape Grenville, Cockburn Islands, and Sir C. Hardy's Islands, projecting towards Raine's Islet opening, and Fair Cape and Cape Weymouth, with Forbes Island and Quoin Island, projecting towards Wreck Bay. Near Sir Charles Hardy's Islands there is also a remarkable narrow channel of deep water, between them and the large Cockburn reef, in which there is a depth of thirty fathoms, while on each side of it is either a reef nearly dry at low water, or a depth not exceeding ten fathoms. This channel is about twenty miles long, rarely more than two miles broad, and it runs in the same direction as the islands lie off Cape Grenville, or about E.N.E., and points in a straight line for Raine's Islet opening.

The law which is found generally to prevail in coral reefs, in all parts of the world, that the widest openings or greatest breaks are on the leeward side, or in the portions most sheltered from surf, is exemplified in the Great Detached reef, and in Raine's Islet and Black Rock entrances, which are each protected by reefs projecting out to windward of them.

The protection which coral reefs afford to coast lines is also observable in the state of the bottom, which, close in shore of the main land, consists of the finest mud, while the coarse sand is accumulated just inside and near to the outer reefs, where the heavy surf is alone found, and in the breaks of

which are found rapid currents, neither of which affect the land. Before entering on any discussion, as to the origin of the Barrier reef, I wish to refer to the masses of coral conglomerate forming strips of flat land along shore behind the present beaches, and to the presence of pumice pebbles sometimes in that conglomerate, but more usually scattered over its surface loose upon the ground. I will also make some observations on the structure and present condition of Raine's Islet.

The coral conglomerate has been already described, especially that at Cape Upstart, and in the Capricorn Group of islands. Flats composed of it, half a mile in width, are frequent along the shore of the north-east coast of Australia. It must either have been formed under water, in which case its existence as dry land proves elevation of the whole coast, or it must have been produced by the piling action of the surf heaping up successive accumulations of calcareous sand, which has been subsequently compacted into rock. In the latter case, it never could have reached *a higher level* than it now has (a few feet above high water mark), and its formation by this action must have required an immense period of time, during the whole of which *no depression can have taken place.* Upon all these flat spaces formed of this conglomerate, as well as upon all other flat land along the eastern and north-eastern coast of Australia, which is not more than ten feet above high water mark, there is found an abun-

dance of pumice pebbles. I have myself observed these at Wollongong, fifty miles south of Port Jackson, and at Wallis Islands, in Endeavour Strait, and many intermediate points. They have been noticed by the Rev. W. B. Clarke and the Rev. N. P. Wilton at several places in New South Wales. They are usually quite rounded, and about the size of walnuts, and at the two extreme points at which I saw them I could perceive no difference in their appearance or condition. They occur, then, under precisely similar circumstances, along the eastern coast of Australia for 2,000 miles. They are never or very rarely seen on the present beach,* or recently washed up, nor are they found now floating at sea. By whatever cause they were cast upon the land, their present position proves that the whole coast where they are found has been equally stationary, or equally affected by movements of elevation or depression since they were so cast. I cannot conceive any cause, such as a sudden wave in the sea, that can have cast them to a greater height above its general level than that at which they are now found. Near Wollongong, and in other parts of New South Wales, there are clear proofs (in raised beaches, &c.) of elevation of the land having taken place in comparatively recent time, whether previously to,

* In the few cases where they have been found lying on the present beach, there were circumstances sufficient to show that they had not been recently washed *up* but *down*, out of the sands, or off the flats behind the beach.

or during, or since the coming of the pumice pebbles, I cannot say. That the advent of these pebbles is not a very recent event, is proved by facts I observed on the north-east coast. I have picked up pumice pebbles, for instance, on sand and mud-flats more than a mile from the sea. If those pebbles were hove up by breakers, there must have been a mile of additional ground added to the flat since the time when they were so hove. If they were thrown on the land by a sudden wave of great magnitude, this evidence for lapse of time would fail, but that they were not so thrown is, I think, made clear, partly by their equal distribution over the flats, but more especially by their frequently occurring in considerable quantities, embedded in the coral conglomerates of which many of the flats are composed. They are also found embedded in the coral rock of Raine's Islet. Whatever age, therefore, may be given to the coral conglomerates must be extended to the pebbles. Altogether, the evidence derived from the existence of the coral conglomerates, and the presence of pumice pebbles, to a height of eight or ten feet above the highest possible tides, proves to my mind that for a very long period the whole eastern coast of Australia has either been quite stationary, or has been affected by slight movements of elevation. It is clear, I think, at all events, that *no recent depression* has taken place throughout the district where either or both of these phenomena occur.

Raine's Islet has already been described at page 126, and in the beginning of this chapter, page 329. I recur to it now for the purpose of shewing that it must have existed at very near its present level for a long period of time. The accompanying diagrams are a plan and section of the island, from a rough survey of my own.

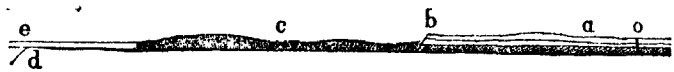
PLAN OF RAINE'S ISLET AND REEF AT LOW WATER.

The part horizontally shaded is covered by water, which in the pools on the reef is very shallow, but outside the reef is so deep as not to have been fathomed, except at one spot, on the N.W. edge of the reef.

At this spot the Prince George was lying with a kedge anchor on the edge of the reef, dry at low water, her scope of hawser or cable was then 20 fathoms long, under her bows she had a depth of 21 fathoms, and under her stern of 35. Her own length was 50 feet, or about 9 fathoms. This gives the angle of the outer slope of the reef from 45o to 55o.

B. The beacon. *G.* The gardens. *W.* The wells. *F.* The flagstaff.
H. The huts. *T.* The tents. *O.* The observatory.

SKETCH SECTION OF THE WESTERN END OF RAINE'S ISLET.



a. Vegetable soil. *b*. Little cliff at edge of stone.
c. Loose coral sand. *d*. Edge of reef.
e. These two lines represent high and low water level, the rise and fall being about 10 feet.

The method of the formation of this island seems to have been the following:—A pile of sand was gradually accumulated near the west or lee side of the reef by the sweeping and piling action of the wind and sea. This, when it had been permanently heaped above high water mark, became partially consolidated into stone near its upper portion, by the action of the rain water, which, dissolving some part of the carbonate of lime, re-deposited it again as it sank through the loose sand, and formed the little concretionary grains which bind the mass together. The lower part of the sand heap, that below high water mark, has been less affected by this action, probably because it was saturated by sea water. Some cause* then stopped the accumulation of sand, and the sea at high water washed away part of that already formed, and eat into this soft stone, wearing it into a little cliff about four or five feet high. This little cliff or step is found all round the island at the edge of the stone, except at some parts of the eastern end. After that, sand was again accumulated, forming the broad margin of loose drift sand now surrounding the island, and protecting the stone from any farther waste by the breakers. No part

* Perhaps this cause may have been a slight depression.

of the island rises more than about twenty-five feet above low water mark, and the rise and fall of tide is about ten or twelve feet.

The proof that this stone had not been formed under water and subsequently elevated is, that it contained fossil turtles' eggs in considerable abundance. These animals always come upon dry ground, and scratch holes in the sand in which to lay their eggs, and these eggs being so deposited, and having, from some reason, not been hatched, had subsequently been consolidated with the surrounding sand into stone. That the island has been nearly in its present state for a long period of time is shewn, I think, by the existence of a thickness of nearly two feet of black vegetable mould in its centre, the result of the decomposition of the few vegetables that cover its surface, mingled with the dung of the innumerable birds that inhabit it.

On a reef, forming part of the Great Barrier, about twelve miles south-west of Raine's Islet, I observed a very remarkable, and, as far as I know, unique fact, which seems to favour the idea of the reef having been slightly elevated in that locality. The mass of reef alluded to is two or three miles long, and from a quarter to half a mile in width. Near its southern extremity, and about fifty yards from its inner edge, there is a range of large coral blocks permanently above water. Immediately to the south of them is a gap or channel of deep water, about a quarter of a mile wide, to the south of which

another reef sets on. These blocks are full two hundred yards from the outer edge of the reef, and protected by it from heavy breakers, and it is only at high water that the last curl of surf reaches them through the gap to the southward. No conceivable storm could lift them into their present condition, with the reef around having its present extension. They not only rested on the reef, but appeared to pass downwards into it as if forming part of its mass. They were composed wholly of a species of porites, very solid and massive, with comparatively small cells. They seemed to be in the position of growth with the cells all pointing upwards. The blocks were often as much as 20 or 25 feet in length, and rose from the reef to a height of 10 or 12 feet; they were very rugged, and apparently much worn, the cells being apparent at the surface in the more sheltered hollows only of the masses. They ran along a line parallel to the inner edge of the reef for three or four hundred yards. High water mark was very apparent on them, forming a horizontal line, below which they were much smoother than above it. They ended upwards in sharp points and crags, much honeycombed and excessively rugged. From high water mark to some of their summits was about eight feet, and a sufficiently large mass of them was visible at high water, to shew like a line of large black rocks, at a distance of two miles. I examined them attentively, and walked about them at low water, and could form

no other conjecture respecting them than that they had been produced under water, and raised above it by the elevation of the mass on which they reposed. They looked exactly like the remnants of a much larger mass that had been gradually eaten away and destroyed by the action of the sea and weather.

Now all the facts which I have just now been detailing go to shew that the north-east coast of Australia has either been slightly elevated, or that it has at least not suffered *any depression* during a long period of time. Those who are familiar with Mr. Darwin's hypothesis respecting coral reefs will see the drift of this remark.

This hypothesis rests upon the assumption that coral-reef-forming polyps do not live at a greater depth than twenty or thirty fathoms, and that, consequently, coral reefs rising abruptly from unfathomable depths must necessarily have been produced by the depression of the bottom of the sea. That wherever we find such coral reefs, the bed of the sea must have once been within twenty or thirty fathoms of the surface, that corals then grew upon it, and that as the bottom was slowly depressed, the corals built upwards, so as always to keep the upper portion of the reef within the required depth.

I must refer the reader to Mr. Darwin's volume on coral reefs for details on this subject, where he will find a mass of materials accumulated and arranged with almost unexampled industry, and rea-

soned on with equal clearness and sagacity.* I will confine myself solely to its application to the Great Barrier reef of the north-east coast of Australia. I tried hard to find any substantial objec-

* In the New Edinburgh Philosophical Journal, Vol. 34, for the year 1843, there is an objection brought forward against this hypothesis of much apparent weight. The objection is, if coral reefs have really the enormous thickness that the hypothesis would assign to them, why do we not find them among our older formations, where we have the old sea bottoms raised into the air? My answer to this objection would be, that in none of the older formations, nor, as far as I am aware, in any well-known tertiary formation, do we find reef-forming-corals. We have abundance of fossil corals that would grow upon reefs, in their more sheltered portions and inner slopes, or that would live in the hollows of other rocks, or form small fringing reefs, where there was no very heavy surf. But we have no fossil corals at all comparable in size, strength, or weight, with the huge mæandrinæ, the massive porites, and ponderous mounds of astræa that compose the great sea-walls of our present "atolls" and large barrier reefs. These gigantic corals are never seen on the inner slopes, or more accessible portions of the reefs, but only in the blocks that lie near its outer edge, where they have been rolled up by heavy gales from its seaward slope. They seem to belong only to the existing order of things, and not to have lived during any of the secondary or early tertiary periods. The present is, so to speak, the *coral reef age of the globe.*

The existence of these great corals, however, furnishes to my mind the only objection to Mr. Darwin's hypothesis which is at all a plausible one. May not these, and perhaps other species or genera still more gigantic, live and flourish at greater depths than the corals commonly found about the surface or inner slopes and sheltered portions of coral reefs? If there should be such corals, and if they formed masses with nearly perpendicular sides

tion to this hypothesis, and must confess I failed to do so. The reader is in possession of all the direct observations I could collect in favour of either the elevation or the stationary position of the district. Admitting the full force of these, and supposing them sufficient to prove that the north-east coast and its barrier reefs have been stationary for a long period of time (say two or three thousand years), or have even been elevated a little in particular localities, this is no valid objection to the hypothesis; because, previously to this time, depression might have been taking place throughout a far more extensive period. The elevation above the sea of the southern portion of Australia, during or since the tertiary times (an elevation that has certainly taken place to an amount of more than 500 feet at least), is no argument against the contemporaneous or subsequent depression of the north-east coast.

Not only did I fail to find any weighty objection

up to a certain height, which afterwards became covered by the known species, the only method of discovering them would be by impressions on the arming of a broad deep-sea lead, either on the weather edge of a coral reef, or by a lucky cast in some spot not yet covered by the known species. To get deep soundings, however, so near the weather edge of a coral reef is a very hazardous proceeding, and only practicable in certain favourable localities. After all, the existence of such species of corals is a mere gratuitous supposition, not admissible into our reasonings, and I suppose their occurrence at great depths would be rendered highly improbable on account of the conditions of light, temperature, and pressure under which they must necessarily be placed.

to this hypothesis, but it seemed to me clearly to explain the reason of both the general form of the Great Barrier and its particular departure from that form.

In the first place, speaking generally, the outline of the Great Barrier reef is parallel to the outline of the north-east coast. The one follows the other in all its curves and flexures with quite sufficient conformability to shew that the two are connected. This is perceptible even in the small chart attached to this work, but still more remarkably so when the large Admiralty charts are examined. It is evident that the circumstances that modified the outline of the coast, likewise determined the general outline of the reefs. This is nothing else than to say, that the outline of the reefs depends upon the depth of the water. Just as in a large and accurate chart of any line of coast we should find the boundary of any certain line of soundings, such as twenty, fifty, or one hundred fathoms, conforming generally to the outline of the coast, following its larger flexures and more important features; so we find the outline of the Barrier reefs conforming to the north-east coast of Australia. Granting that the mean slope of the rocks, forming the original sea bottom of this coast, was tolerably regular and conformable to the slope of the land, it is evident that if we took away the coral reefs and raised the land to any given height, as, for instance, 100 fathoms, we should not greatly alter the outline of

the coast, but only shift its situation. It would be thrown so much further forward, or towards the east. Now suppose the coast cleared of coral reef, and raised so much that it emerged from the sea just within the line of the present Barrier reef. Then let the reef commence in the shallow water along that shore, and a very slow and gradual depression take place, giving time for the polyps to build up so as to keep near the surface of the water. The result of this action would be the present Barrier with its steep outer slope, and its gradual extension over the sinking rocks that were once dry land within it. Portions that were once hills on the dry land would now be islands between the Barrier and the main, such as Sir C. Hardy's Island and those about it. Islands that once existed in front of the main land would now be altogether submerged, and their places only marked by detached reefs outside the Barrier, such as those north and south of Wreck Bay. According to the old rule of high land and deep water going together, (in other words, the slope of the ground below water being only a continuation of that above,) we should have the Barrier much closer to the present land in its more abrupt and lofty portions than in those which were lower and less highly inclined. We see accordingly the reefs approach the present land about Cape Melville, where the land is steep and lofty, and recede from it as we go further north in proportion as the land becomes flatter and more gentle in

its inclination. Deep holes and ravines, full, perhaps, of fresh water, may have existed on the old land, so that when the surface of these lakes and hollows first sank to the surface of the sea, and admitted its waters, the bottom may have been too deep for the coral animals to live on. This would explain such a phenomenon as the deep narrow channel just north of Sir C. Hardy's Islands, with reefs running along each side of it. In short, every modification in the form and structure of the reefs is explicable by this hypothesis, and many difficulties solved, which admit of no other explanation.

It may seem uncalled for in me thus to thrust forward my opinion of Mr. Darwin's work; but after seeing much of the Great Barrier reefs, and reflecting much upon them, and trying if it were possible by any means to evade the conclusions to which Mr. Darwin has come, I cannot help adding that his hypothesis is perfectly satisfactory to my mind, and rises beyond a mere hypothesis into the true theory of coral reefs.

If the fact of depression of the north-east coast during the formation of the great coral reefs be held as proved, it follows that, during the early part of the period of their formation, Torres Strait, and the shoal seas on each side of it, were dry land, and Australia connected to New Guinea. This would explain, perhaps, the fact of the marsupial type of animals being common to both, though the genera and species are different. It would explain also the difference in the assemblage of shells, etc. on the

northern and southern sides of Torres Strait mentioned before, page 229, as each group would spread into the newly-formed sea, from the nearest adjacent shores, the Molucca group coming from the north, and the Australian from the south.

The existing vegetation of the two countries would seem to have originated, or at least to have spread over their opposite shores since their separation.

The speculations hinted at here were, I ought to say, suggested to me by the perusal of Professor Forbes's most original paper on the Distribution of the British Fauna and Flora, in the Memoirs of the Geological Survey of Great Britain.

CHAPTER XIV.

FIRST VISIT TO PORT ESSINGTON IN AUGUST, 1843—GENERAL ASPECT OF THE COUNTRY AND SETTLEMENT—GEOLOGICAL STRUCTURE, STERILITY, UNHEALTHINESS—NATIVE TRIBES —SECOND VISIT IN SEPTEMBER, 1844—THIRD VISIT IN JANUARY, 1845—ARRIVAL OF A NEW PARTY—PRAHUS COLLECTING TREPANG—METHOD OF FISHING FOR, AND OF PREPARING TREPANG—CAPABILITIES OF PORT ESSINGTON—TOTALLY UNFIT FOR AGRICULTURAL PURSUITS—NO ADVANTAGES FOR COMMERCE—INCONVENIENTLY SITUATED AS A HARBOUR OF REFUGE—FOURTH VISIT IN JUNE, 1845—CONTRAST BETWEEN THE VEGETATION OF PORT ESSINGTON AND CAPE YORK—DEATHS AMONG THE NEW PARTY—POLITICAL REASONS FOR RETAINING PORT ESSINGTON.

August 19, 1843.—At eight o'clock this morning we first made the land about Port Essington. The shore appeared very low, the first thing that came in sight being a level line of trees. We next made out a small round tower, which had been commenced on Point Smith, and entering between this and Vashon Head, we floated gradually up the port with very light winds. The atmosphere felt very hot and close, after the fresh breeze we had been accustomed to in Torres Strait, and on the north-east coast. The sides of the harbour were formed by several low rocky headlands, or small ranges of

cliffs, about twenty or thirty feet high, generally of a red or white colour. Between the headlands were shallow coves backed by mangrove swamps, and the level country round seemed completely covered by a low but dark looking wood of small gum-trees. After floating up this inlet for about sixteen or seventeen miles, we anchored a mile from the settlement; shoal muddy bays running still several miles farther to the south, backed by mangroves and gum forest. The aspect of the place was anything but cheerful or inviting even to us, who had been so long at sea. On a piece of land, about forty or fifty feet above the sea, on the west side of the harbour, the trees seemed partially cleared away, and we could see through those that remained a few white buildings, while a small square wooden blockhouse with a flag-staff stood on a projecting cliff. A little a-head of us lay the Royalist brig of war refitting, which gave some animation to the scene, and off a small half ruinous wooden pier were one or two boats at anchor, with an old looking shed on the beach. We remained here six days at this visit, and stopped for about an equal length of time on three subsequent occasions, during which, I believe, we saw all that was to be seen of the place.

The party, in 1843, consisted of Captain M'Arthur, Lieut. Timson, Dr. Whipple assistant-surgeon, Mr. J. M'Arthur acting store-keeper, and thirty-seven men. The number of men was originally greater, but several had died, and all had been

more or less affected with intermittent or remittent fever and ague; they now looked very sickly and debilitated, and many were still in hospital, or had only just come out of it. The buildings consisted of a wooden cottage of three or four rooms for the commandant, a wooden hospital tolerably spacious and airy, two wooden buildings of two stories,—the upper for mess-room and officers' quarters, and the lower used as store-rooms, and a square, surrounded by small huts built of reeds and thatch for the men. Several of the men had small gardens round their huts, containing a banana, or cocoa-nut tree, and a few vegetables; and at a little distance from the settlement were two gardens, containing from one to two acres each. One of these was behind the sea beach to the southward, the other at the head of a shoal muddy cove just west of the settlement, containing some moist soil behind the mangroves. In these gardens were young cocoa-nut trees, not yet arrived at sufficient maturity for bearing; banana trees, some of the fruit of which was of very good flavour; pine apples, which seemed to do well, and some plots for growing yams and sweet potatoes. In the moistest parts of one of the gardens were specimens of the bread-fruit, the coffee-tree, some rice, and other tropical plants, all of which seemed to thrive in that spot. The soil generally, however, in and around the settlement seemed of the poorest and most sterile description; indeed, it could hardly be said that anything ex-

isted worthy the name of "soil." The subjacent rock is a softish sandstone, sometimes red, sometimes white, sometimes quite friable and powdery, at others harder and tougher. It contains many irregular concretionary nodules and masses of a kind of ironstone, which sometimes occur in such abundance as to almost obliterate the sandstone, and form a heap of irregular concretionary lumps, with little appearance of bedding or lamination. These masses of ironstone, when found in the cliffs, generally form small headlands, the sandstone having been worn away on each side. The sandstone itself is regularly stratified, and lies apparently in a perfectly horizontal position. The surface of the ground around the settlement, except in the swamps and lowest hollows, is composed wholly of the detritus of these rocks, without any apparent mixture of vegetable soil. It consists of a sand full of small ironstone nodules. In the untouched parts of the adjacent bush, the sand was compact and the ground strewed with these small nodules, which, in appearance, resembled pebbles. Scarcely a blade of grass, and little or no under-growth of any kind, was to be seen over large tracts. The forest, or "bush," generally looked like a badly-kept gravel-walk, on which small gum-trees were growing. Here and there was a little straggling grass, now all brown and burnt up; but, literally, within half a mile of the settlement, I do not think enough green stuff of any kind could at this time be found to keep a cow,

a horse, or a sheep. At one or two miles distant, however, were some lagoons, still partly covered with water from the last rainy season, on which grew a rank grass, which, though by no means of inviting or nourishing appearance, sufficed to feed the few oxen, buffaloes, and Timor ponies belonging to the place. Added to these, two or three goats, a few fowls and pigs, completed the list of their present live stock. A buffalo was killed every day during our stay, and we got a small supply of yams and sweet potatoes for the ship's company; but when there is no vessel in the harbour, a buffalo a day would be more than they could consume, and as the meat would not keep till the next, it is not thought advisable to slaughter them. As the gardens, also, are not equal to a constant supply of vegetables, they live during the greater part of the year pretty much as they would on board ship, on salt provisions, biscuit and rum, varied by an occasional kangaroo or a dish of fish. In the latter the harbour abounds, but there are commonly too many men sick to enable the remainder to form a party large enough to haul the seine.

Captain M'Arthur informed me, that for the first four years the party was healthy, but that last rainy season had been remarkably heavy and protracted, to which he attributed their present sickness. This rainy season commenced in October 1842, and lasted till April 1843, instead of, as usual, beginning late in November and ending early in March.

The natives here are the same in aspect, habits, and character, as those of the rest of Australia. I endeavoured to learn something respecting their division into ranks or classes, as described by Mr. Wilson, in his Voyage round the World; but, although it appears they have the terms of "mandrowillie," &c., which he mentions, I could not get much information about them. One thing is certain, that any distinction of rank must be purely nominal, as no such thing is apparent in their ordinary communications with Europeans, and the condition and employments of all are precisely the same. There are several tribes in Cobourg's Peninsula, three of which are seated on Port Essington, as their natural possessions; one occupying the head of the harbour, and one each side of it. The languages of these tribes differ one from the other, but are all kindred dialects, each tribe, when speaking their own, being intelligible to the other. Ever since the formation of the present establishment at Port Essington, the whole of the natives have conducted themselves peaceably, and submitted in all things, to the dominion of the white man. They occasionally have pilfered rice and other things from the stores, but have never offered any resistance, farther than struggles to escape, when apprehended for such an act. One white man, walking into an encampment of natives, and seizing a black fellow as a thief, has never even had a spear raised against him. Captain M'Arthur, on one occasion, ordered

one of them to be imprisoned for two days, for some petty theft. Confinement, however, had such an effect on him, that he was obliged to let him out before the time expired, or it was thought he would have died or gone mad.

A party of us made a boat excursion of two days down the harbour. We landed first near Cayman Creek, but found the country there so dry and burnt up that no living thing was to be seen. We observed on the sand of the beach, however, the impression of an "alligator,"* about ten feet long, with every scale distinctly marked, which had been basking in the sun. In a calm, several of these animals may be seen at once, floating on the water, they appear to be almost entirely confined to the sea, and are said to visit the lagoons and fresh-water pools solely for the purpose of breeding.

We then visited some lagoons lower down, where we got some tolerable sport among the wild fowl that night and next morning. We then crossed to the other side of the harbour. Here, about Knocker's Bay, the whole country was a bare sandy or stony plain, covered with gum-trees, except a hollow, through which ran a drain of fresh water.

We returned from this excursion with anything but a favourable impression of the fertility of the soil in the neighbourhood of the harbour. We were

* These animals are, I believe, really crocodiles, and, as Mr. J. E. Gray informs me, of the same species as the common crocodile of the Ganges.

informed that better spots existed farther back in the country, but these were principally described as lagoons covered with water in the rainy season. The general character of the land of Cobourg's Peninsula was acknowleged to be much the same as that we had seen, and beyond the peninsula nothing was known of the country, no one having yet crossed the isthmus on to the main land. From Captain King's description of the adjacent shores they seem to be as barren as the rest of the north coast of Australia is described to be, by all who have visited it from the time of Flinders to the present.

In September, 1844, we touched at Port Essington, and left there our party of convict masons under the charge of Lieut. (now Commander) Ince, while we went to Java to refit. Mr. Macgillivray also remained there. They stayed during the rainy season, or till the following February, and during that time were healthy. Messrs. Ince and Macgillivray expressed themselves as much pleased with their sojourn of four months at Victoria, as they found good sport among the wild fowl in the neighbouring lagoons. Their stay also was enlivened by the arrival of the new party of fifty marines to relieve those previously stationed there. The old party returned home, with diminished numbers and broken health, under the command of Lieut. Timson, and with Dr. Sibbald, our former assistant-surgeon, who had exchanged with Dr. Whipple.

Our third visit to Port Essington was at the

latter end of January, 1845, on our return from Sourabaya, in the island of Java.

We anchored inside the heads of the bay on the night of January 27th, having been close in with the shore all the afternoon, and had thus a good opportunity of comparing the aspect of the country with that of the islands we had left so recently. It gained nothing, however, by this circumstance. A low, level strip of land, without a single prominent feature, covered with a thick but short and stunted-looking wood of brown-leaved trees,—it seemed ten times more sombre, dismal, and monotonous than we had previously thought it. It had always appeared sufficiently uninviting, even when we had been accustomed to the dark woods and barren shores of Australia; but now, when we had so recently left countries abounding in beauty and fertility, it looked really melancholy.

On landing at the settlement next day we found it in a much better condition than we had previously seen it; a scanty, but green grass somewhat hiding the brown ground. The huts and houses also had been freshly white-washed. The new party, consisting of fifty men, had arrived in November, under Lieutenants Lambrick and Wright, and Assistant-Surgeon Tilson. Captain M'Arthur still remained as Commandant. Lieut. Lambrick, having little idea of the nature of the place he was coming to, had brought his lady with him, fancying that it might be a small settlement or colony, rather than a mere

solitary post. Even in Hobarton, where they had touched on coming out, he could get no information as to the extent of the place, and the most erroneous ideas seemed to have been held of it.

From Messrs. Ince and Macgillivray we learnt that the rainy season had been moderate, one or sometimes two squalls of wind and rain every day, with thunder and lightning, but no long continued rains. They had, however, a short time before our arrival, had a gale of wind from the S.S.E., almost amounting to a hurricane, blowing down trees, and lasting with great fury for four or five hours.

There were two Bugis prahus, from Macassar, at anchor in the harbour, being part of the trepang fleet; small, poor, dirty-looking things, like the common fishing prahus of the archipelago. One had arrived in ten, the other in fifteen days from Macassar. Their crews were like the vessels, ragged and very poor-looking, evidently belonging to the very lowest of the people; so that I should think the voyage can hardly be a very profitable one, or a higher class of people, and better vessels, would be engaged in it. They spoke Malay in a different dialect from that used at Sourabaya, and though very civil and quiet, were dull, and rather stupid-looking men. On Jan. 30th another prahu arrived, and reported that four others had been lost outside, having foundered in a gale of wind, and all hands lost, except the crew of one that they had been able to save. This prahu

also brought back a native of Port Essington, who had gone away with them last year to Macassar. This we were told was not an uncommon occurrence, as the natives of Port Essington are very fond of going abroad to see the world, and the Malays, having a great dread of them in general, are glad to humour them. The prahus anchored off Garden Bay, just above the settlement, and then proceeded to collect and cure the trepang. During the day all the "sampans," or canoes, belonging to the prahus, disperse into the bays and coves of the harbour, and collect the trepang (holothuriæ), either by picking them up at low water, or by diving for them at various depths, up to two and three fathoms. The kind most commonly got is one about six or eight inches long, in its contracted state, of a grey colour, dark above and whitish beneath.

At sunset they come in with their cargoes, and landing them on the beach, another set of men proceed to cure them. For this purpose they erect, a little behind the beach, a shed, made of bamboo and "attop" mats, about sixteen feet long and eight feet wide; this is covered by a gable-shaped roof of attop mats, the eaves of which are about five feet from the ground, at which height a stage or platform of split bamboo is spread from one end of the shed to the other. The ground inside the shed is excavated to the depth of two or three feet, so that the flame of the fire lighted in it may not catch this bamboo platform nor the sides of the shed. Outside the shed they have a

row of shallow iron pans, so arranged on a kind of open platform of large loose stones, that a brisk fire may be kept up under each pan from one end of the row to the other. These things being ready, and the trepang landed, they cut open each animal longitudinally, clean out the inside, and plunge it into boiling water for a short time. Having thus prepared it, they boil the whole in the iron pans in salt water, together with pieces of red mangrove bark. Two men are kept constantly at work, attending to eight or ten pans, stirring up the trepang with wooden ladles, adding fresh water, and feeding the fire. It is boiled in this way the whole night, or from eight to ten hours, and then removed to the shed. Here it is spread out in a single layer on the platform of split bamboo, and the fires being lighted below, it is then dried and smoked till ready to be packed away. Each piece is then much shrivelled and shrunk up, and has acquired a dirty, reddish hue. The whole shed is kept carefully covered in during the process, the only entrance being by a small door at one corner, and each end of the gable is protected by a hanging mat. These mats, as I have called them, for want of a better term, are those commonly used by the Malay races for roofing sheds, covering cargo boats, &c.; they are, in fact, slender hurdles, covered on one side with a thatch of dry palm-leaves in strips, the ends of the leaves overhanging the sides and bottom of the hurdle, so that by placing them in rows, side by

side, with the bottoms of the upper ones resting on the tops of the lower ones, any sloping surface or frame-work is immediately provided with a water-tight roof.

The weather, while we were in Port Essington at this time, was mostly fine, but very hot: in the shadiest part of the hospital, which is the coolest and best ventilated building in the place, the thermometer was often as high as 96° at eight o'clock in the morning, and sometimes above 100° at noon; after that a heavy thunder shower would commonly occur, producing a sensible relief. Captain M'Arthur informed me that this season there had been less rain than was usual at this time of the year. There was some talk of throwing open Port Essington as a colony, and selling land to any body willing to purchase at the common Australian rate, namely, an upset price of £1 per acre. I am at a loss to conceive what any one could do with land here, if he even had the whole peninsula given him. Sheep, if they lived at all, would soon have their woolly coats converted into hair. There is but little food and no market for cattle. Rice might probably be raised in small quantities on the borders of the lagoons; but to raise either rice, sugar, coffee, cotton, or any other valuable tropical produce, for *export*, requires both large tracts of rich soil and an abundant population; two things which do not now exist at Port Essington, nor, I will take upon myself to assert, ever can be formed there. A few

Malays or Chinese might be induced to emigrate, and would support themselves in detached spots, no doubt; and the introduction of as many such labourers as could be supported would be a great assistance and comfort to the few Europeans condemned to be stationed there. Without a few such labourers, indeed, to cultivate their gardens for them, and supply that quantity of vegetables and fruit which they have not, by their own exertions, been able to bring into existence, it seems to me a piece of downright cruelty, to compel or induce even a military party to remain there. As a place for the production of any kind of export, then, Port Essington is, in my opinion, utterly useless; nor do I see how it can become a place of any commerce. What could induce, for instance, any European or Australian merchant to send a cargo of goods to Port Essington? or, if a store of goods were there, what could induce any one to come there to buy them? If a vessel were to come up from Sydney to sell a cargo of goods among the Moluccas, or neighbouring islands, why should she turn aside and stop at Port Essington? All the neighbouring islands are either in the power of the Dutch, or independent. Now, the best plan for a vessel wishing to trade with the independent islands, obviously, is to go to them at once; while she has just as good an opportunity to smuggle her goods directly into the Dutch islands, if that be her object, as the natives would have if they were to

come and fetch them from Port Essington. All the prahus that come from Macassar to the north coast of Australia sail under the Dutch flag, and under Dutch inspection. They sail by the Dutch license, and on returning, have to pass through the Dutch custom-house, are no doubt rigorously searched, and would have to pay heavy duties for every article of English or foreign manufacture. The most that the residents of Port Essington have ever been able to purchase from the prahus that come there, is a bag or two of rice and half a dozen or a dozen fowls. As for their crews buying any English goods, if they were to be procured at Port Essington, the appearance of the men at once betokens their utter poverty. With a great desert on one side, and islands peopled principally by savages on the other, I can see no advantages in the situation of Port Essington. Its harbour is certainly an excellent one when it is entered; but for a stranger, it is both difficult to find and dangerous to approach. There are shoals to the eastward of it, which render it almost necessary for a vessel to keep out some miles to seaward. The land is so low, that it cannot then be seen, and the navigator has to depend solely on his reckoning for knowing when he has arrived in the meridian of the harbour, and must haul his wind to the southward. When he comes within sight of land, it is difficult to make out the mouth of the harbour for want of any natural land-mark of importance; while, if he make a mistake of a mile or

two, the Orontes Reef lies right off the mouth of the harbour to pick him up.

To visit the settlement of Victoria, which is sixteen or seventeen miles up the harbour, would generally ensure any passing vessel a total detention of at least two days; that is to say, she must lose two days from the time she first turned aside from the ordinary track before the trade wind, till she regained that track. To induce a vessel to look in there, then, she must have some specific object of importance.

The sole remaining advantage of Port Essington is, as a harbour of refuge for wrecked crews; but even for that purpose it is very inconveniently placed, being 600 miles away from the extreme limits of the sea, where wrecks are most likely to occur, namely, the Coral Sea and the eastern side of Torres Strait. I do not know the reasons which led to the establishment of a military post at Port Essington, but conclude they were political ones, connected with our territorial rights.

On *June* 12, 1845, we called at Port Essington, for the fourth and last time. We had left Cape York three days before, and although the character of the vegetation at the two places was precisely the same, we were much struck with the difference in its condition. At Cape York the grass and the trees were still as green as in the preceding February, or the middle of the rainy season. At Port Essington, on the contrary, save a few palms and pandanus

trees, hardly a green thing was to be seen, all other leaves and grass being of a dull brown. The new party, although they had only been there six months, had every one been affected by fever, had become sallow and emaciated in their appearance, and of their original number of fifty, four were already dead. Although this was the coolest part of their year, it was still the hottest and most oppressive place we had visited since we left it.

I rode towards the head of the harbour, and to the "Pig lagoon." Notwithstanding that the grass in a few low swampy places was as tall as my head, it was all dry and brown, and looked more like ripe corn than grass. The swampy ground of the "Pig lagoon" seemed to me of a very indifferent character, a sandy clay, with a very "sour" soil, that would require, I should think, much management before it became fertile, even for rice.

I have been more particular in the details of this account of Port Essington, because I have seen in print such very opposite descriptions of it. I visited it, at first, with preconceived notions greatly in its favour, was rather disappointed in its first aspect, but concluded we saw it under peculiarly unfavourable circumstances. Three subsequent visits, however, at different periods of the year, including the most favourable one, compelled me, with some reluctance, to lay aside all the preconceived notions I had formed of its importance and value as a British settlement. I believe it to be utterly worthless as a colony, or as

an agricultural or commercial possession, and conceive the only argument for our continuing to hold it must be a political one. It forms the northern link between our colonies on the eastern and western coasts of Australia, assures us the possession of the north and north-west coasts, and as it were, closes the ring-fence with which we have now girt the fifth quarter of the globe.

CHAPTER XV.

COUPANG, TIMOR—ASPECT OF COUNTRY, AND OF THE TOWN—MONEY TRANSACTIONS—REFRESHMENTS—THE CHURCH, SCHOOL, AND SCHOOLMASTER—CHINESE—MALAY RAJAHS—APPEARANCE OF THE PEOPLE—PIRATES—ABORIGINES—CHURCH SERVICE IN MALAY—EXCURSION UP THE VALLEY—VIEW OF THE INTERIOR—GEOLOGICAL STRUCTURE—RAISED CORAL REEF.

September 2, 1843.—We found ourselves this morning at anchor within about half a mile of the town of Coupang, in the island of Timor, which appeared more considerable than I had expected. The bay runs some ten or fifteen miles further to the N.E., in which direction lofty mountains shewed themselves at a great distance in the interior of the island; many of them having sharp peaks and jagged serrated outlines, with lower ranges between them and the sea of a smoother and more level form, but preserving a height of several hundred feet, pretty close down to the coast. At the back of the town of Coupang successive ridges of land gradually rose to the height of about 500 feet. They were partially covered with wood, while in the low lands, behind the beach, were large groves of cocoa-nut

trees. The sand of the beach was broken here and there by small headlands, ending in little precipices of dark rock. On one of these cliffs is the fort of Concordia, a mere wall surrounding some stone buildings, and apparently in a very dilapidated condition. Its strength could never be great, as it is commanded by higher land immediately behind it. Just under the fort, on the eastern side is a brook, the mouth of which admits small boats at low water, and at high tide is sufficient to float up small prahus, and other native craft, for about one hundred yards. East of this, again, is the town. This consists of two principal streets, running parallel to the beach for about a quarter of a mile, with two small irregular streets crossing them. The houses near the sea are mostly small, and inhabited principally by Chinese, consisting of small shops and storehouses, of which latter two or three belong to Europeans, either Dutch or Frenchmen. Behind the town is an open space of grass, shaded by fine tamarind-trees, on one side of which is the house of the Resident, and on the other is the brook, in which the inhabitants are always bathing or washing clothes. One or two roads run up the valley, leading to two or three tolerable houses belonging to Europeans, and to many huts or cottages of Malays, forming generally small clusters. The little valley behind the town was very pleasant, being watered not only by the brook but by many small rills conducted from it higher up, and carried either in

wooden troughs or stone channels to the gardens and houses of the inhabitants. Groves of cocoa-nuts, bamboos, and bananas, stately tamarinds, and other tropical trees and plants, lent their shade and beauty to the scene, which, with the white walls and red-tiled roofs of the houses, and the many natives in strange dresses, formed so great a contrast to what we had been accustomed to for many months on the coast of Australia, as to be highly agreeable. This beauty and fertility, however, were pretty much confined to the valley, as on the top of the higher land on each side of it the soil seemed rather bare and sterile for some distance.

One of our first inquiries was for fresh provisions, fruits, vegetables, and sea-stock; but here we found an unexpected difficulty in procuring cash for our bills. After much trouble, a young Frenchman undertook to cash us a Government bill for 38*l.* in copper. It appears that they reckon here in rupees, of which there are two kinds, the silver and the copper, the latter being only an imaginary coin. The silver rupee contains 120 doits, the copper rupee is 100 doits, but as silver is scarce, and indeed not to be got except at a great premium, we were to take all copper. The current coin is the doit, a little copper coin, the value of which was reckoned to be one-sixth of a penny sterling, the silver rupee of 120 doits being valued at 1*s.* 8*d.* English. An English shilling, however, would only go for half a rupee, but a Spanish or Mexican dollar for 2½

rupees. We had agreed with the sons of a Dutch merchant, of the name of Tielman, to supply us with what we wanted, if we could procure the coin, and, having got it, it took eight or ten persons to carry our 38*l.* worth of copper to his house. The doits were made up in bags of matting of various sizes, corresponding to different sums of 25, 50, or 100 rupees, each of which bags was both weighed and counted before it was taken. We got plenty of fowls at 6 rupees, or 10*s.* per dozen; pigs at 16*s.* each; a few goat-like sheep, some yams, greens, indifferent oranges, and good shadocks, bananas, and cocoa-nuts. We paid, however, for these much more than the regular market prices, or than we could have got them for, had we had the requisite cash, and could have spoken Malay, and gone into the market and neighbouring villages to bargain with the natives. Pretty good buffalo beef and fresh vegetables were procured for the ship's company. The small traders of the town seemed to have an excellent turn for roguery and imposition, as the prices of things were often raised two or three times successively, and in one instance doubled after the bargain was concluded. Having settled this important affair, we strolled round the environs of the town; and among other places, went into the church, a pretty spacious brick edifice. Here we found a schoolmaster, who spoke English, and who was teaching two classes of children, the one European, chiefly Dutch, the other Malay. Most of the children of European extrac-

tion had apparently some tinge of native blood, and were generally pale and sallow looking. The Malay children were clean, neat, and many of them good-looking and intelligent. The schoolmaster produced a few Malay hymn-books, and seating himself at a small pedal organ, he made them sing some hymns and psalms. The hymn-books had an appearance of considerable antiquity, and the musical notation under the words was of that ancient kind that in England one only sees in old manuscript music in cathedrals, the long notes or "breves," being of a square form. The children sang very fairly, and seemed very docile and attentive. The Dutch clergyman here has taken much trouble with the Malay inhabitants, many of whom are Christians. He had resided here ten years, and had just received an order from the King of Holland for his services. At this end of their East Indian possessions, indeed, the Dutch have been much more attentive to the native population than in their more important dominions of Java and its neighbourhood. Several of the islands off the eastern end of Timor are entirely Christian, and remained so even when there were no Dutch missionaries left among them.*

In walking about the town I had an opportunity of seeing, for the first time, something of the manners of the Chinese. They all wear their national dress, and are generally a plump, laughing, good-

* See the "Voyage of the Dourga in the Molucca Archipelago, by Mr. Kolf," translated by Mr. Earl.

humoured people. On our stopping at one shop door, to see two stout old gentlemen eating rice with chop-sticks, they invited us in with much urbanity, and went on with their meal, appearing much amused at our curiosity. On a rising ground, at the back of the town, were a number of Chinese tombs, under the shade of some large tamarind-trees, cut in the side of the hill, having a flat smooth space surrounded by a low wall, in a horse-shoe form, with a Chinese inscription in the centre, precisely as described by travellers in China.

The Dutch houses were of the form generally adopted by that nation in the east, the principal room being a lofty hall occupying all the centre of the house, floored with large diamond-shaped red tiles. While sitting in the hall of Mr. Tielman, two Malay Rajahs, or petty chiefs of the district, came in, and I was much interested in seeing their polite and ceremonious manners. Each was followed by two or three attendants, one of whom bore a large gold-headed cane, on which the arms of the Dutch Government were engraved, being his staff of office, as recognised by the authorities. They were dressed in flowered chintz of gay patterns, and on meeting, saluted each other and Mr. Tielman with much grace and good breeding, offering each other chairs with a wave of the hand quite in the style of European gentlemen of the old school. When seated, the attendants with the canes stationed themselves each behind his master's chair,

while the others squatted down on the floor to be within call if wanted. I certainly was not prepared to meet, among the natives of such an out-of-the-way corner of the world, with manners, evidently habitual, so completely in accordance with what we should consider the usages of good society, and regretted my ignorance of the Malay language prevented my entering into conversation with these native gentlemen.

In walking about the environs we saw many of the inhabitants coming in with baskets of fruit, vegetables, eggs, and poultry. They generally carried two baskets slung over the shoulder on a flat yoke of bamboo, which resembled in form an unstrung bow. The men were scantily dressed, either in a tight wrapper round the loins, or at most with the sarong or petticoat from the waist to the knees, but nearly all carried a kriss stuck into the back of the dress. The women were all decently clothed from the neck to the ancles in a loose gown and petticoat. Many of the men were athletic, with stout limbs, but generally under the middle size. The women were by no means handsome, their faces being greatly disfigured by the use of the seri or beetel, and their mouths were smeared all round with a dirty red colour.

Their houses were made chiefly of bamboo, thatched with palm-leaves, and consisted of one or two apartments, the floors being not commonly raised above the ground: each was surrounded

by a small court-yard or garden, in which grew plantain and cocoa-nut trees. The inhabitants were now said to be suffering greatly from small-pox, and also from fever and ague, this being the unhealthy season of the year in Timor.

On going on board in the evening, we found a small schooner had come in under Danish colours, that had been trading among the neighbouring islands. Her master said she had been nearly taken on the north side of the island by six or seven prahus that had pulled off to her during a calm, and that she escaped only by a lucky breeze springing up. It was reported, also, that two months ago an English whaler had been taken on the north coast, within thirty miles of Coupang. She had sent a boat ashore with a party to get wood, where they were cut off by the natives; a squadron of prahus then put off for the ship, on seeing which, the master abandoned his vessel, and went off in his boats to two other whalers that were in sight in the offing. His ship was boarded by the prahus, plundered, and burnt before the other vessels could come up to her assistance. The Malays, and other maritime inhabitants, that are settled on the coasts of these islands, are just in that state of quasi civilization in which piracy is most rife. Like the Greeks of old, before the time of Herodotus, or the Northmen among the European nations some hundreds of years ago, piracy is considered honourable among them, rather than otherwise. If a Malay

chief, or petty Rajah, ruins himself by gambling or dissipation, he immediately collects a band of disorderly people, always ready to follow him, and issues forth in his prahu to better his fortune. Each Rajah, too, being practically, if not nominally, independent, and under the control of no laws, can at any time go to war with his neighbours, or with strangers who come into his neighbourhood, and it is considered a brave action, and one worthy of the fame of his ancestors, to carry an European or other large vessel. He has, therefore, often the incitements of both honour and profit to induce him to commit what we consider a felony. The north coast of Timor, as of many of the neighbouring islands, is inhabited partly by Malays, who have dispossessed the aboriginal inhabitants, and driven them into the interior. The sovereignty of the island is claimed by the Dutch and Portuguese, the former arrogating the S.W. half of the island, and the latter the N.E. Their power is confined, however, almost entirely to the immediate neighbourhood of their two principal posts, of which Coupang belongs to the Dutch, and Dielli to the Portuguese. The force kept by the Dutch at Coupang consists of fifty soldiers, of whom ten only were Europeans, under one or two European officers. That at Dielli is still more insignificant, there being not more than one or two Europeans in the place, and scarcely any troops at all. Neither nation keeps any naval force in the island, so that the natives of the coast are

quite unrestrained when out of sight of the two principal posts. The south side of the island being exposed to the trade wind, which blows from the S.E. eight months in the year, and being destitute of harbours, is occupied, I believe, solely by the original Timorese, who likewise possess all the interior of the island. These Timorese are said to be a totally different race to the Malays, to have frizzled hair, and to be allied to the Papuans. Their language is quite different from any of the Malay tongues.* Their customs are said to be analogous to the Papuan, especially that of esteeming the possession of the head of an enemy a great honour, it being nothing to have killed an enemy in battle unless his head is taken; while, to lose the head, is considered the greatest disgrace. Flores is said to be the western limit of the frizzled-haired race, all to the west of that being inhabited by races with long straight hair. The frizzled-haired people are said to be of a much more ferocious natural disposition, and to be generally much ruder and more uncivilized than the others. The Timorese are said in the interior to inhabit houses consisting of a mere roof of palm-leaves on four rude posts, and to cultivate but little ground, living pretty much in a state of nature. They collect sandal-wood and bees-wax, however, which they bring to the coast, and barter, preferring gold and silver

* See "Notices of Indian Archipelago and adjacent Countries. A collection of papers, &c., by J. H. Moor. 4to. Singapore."

coin to other commodities, which they are said to make into ornaments.

Gold mines were reported to exist in the interior, but nothing was certainly known about it. The island abounds in several kinds of deer, but I heard of no other animals. Among birds, pigeons and quails were spoken of as most numerous, the former especially, having many varieties. I could not help thinking that if we had had possession of this fine island for upwards of 200 years, it would have been both more known and in a higher condition than it is at present. They had now been seven months without any communication with Batavia or Java. I was informed that the Resident had 1000 rupees a month as salary, of which he got one-third in silver and the rest in copper. At the rate which they charged us for rupees this would make 1000*l.* per annum; but we afterwards learnt that the rupee, instead of 20*d.*, was not at present worth more than 15½*d.* sterling, which would make his salary about 780*l.* per annum.* Coupang is now a free port, and is accordingly much used by whalers and other vessels as a place for procuring refreshments. Excellent water can be procured on the beach where it is brought in a pipe from above the town.

September 3.—To-day being Sunday, a party of us went to church out of curiosity to hear the

* In Java, in 1844, the pound sterling was worth 15·40 rupees silver.

service in Malay. The congregation was rather thin, owing, it was said, to the prevailing sickness among the native population. The clergyman preached with great apparent fluency and distinctness, and the people were very attentive. At the conclusion two men went round with black velvet bags, at the end of long black sticks, to collect contributions. We afterwards walked about a mile above the town, up the valley of the brook, where I saw enough of the geology to excite my curiosity to know more. I accordingly gave up an excursion with Lieut. Ince to the head of the bay, and devoted the next day to the examination of the immediate environs of Coupang.

September 4.—I was ashore before daylight, and engaging a sharp little Malay boy to carry my bag, I proceeded up the valley. This expands to about a quarter of a mile in width, above the town, where it is laid out in small paddy fields and little plantations carefully irrigated, intersected by narrow roads arched over with trees. In about a mile it is contracted into a mere ravine, with rocky, precipitous sides. After working for some hours here, I climbed by a narrow path up the western side of the ravine, and came out onto a commanding ridge, from which I got a view of some miles into the interior. Here stood a two-storied house, in a European style of building, belonging to a native Rajah. The shutters were all closed, and I did not see any body but two men at work under an adjoining shed, who, after

questioning my little guide, allowed us to repose under a fine tamarind-tree, while we eat some refreshments we had brought with us. A little Chinese youth had also joined us here, and though neither could speak more than one or two words of English, and I none of Malay, I was much amused by their sharpness and apparent intelligence. From the spot where we sat, we looked down into one or two valleys, and over one or two intermediate rocky ridges, with higher land on either side of us. The view was very beautiful, as the country seemed to improve in richness as it receded from the sea, and not only the valleys, but the rocky heights were covered with magnificent woods of lofty umbrageous trees, of all shades of green, out of which, here and there, rose a stately areca-palm, lifting its feathery top high into the clear sunshine. I could not help contrasting the general character and aspect of the vegetation with that of Australia. The difference between the latitude of this place and Port Essington is not more than forty miles. The actual distance between the island of Timor and the coast of Australia is not greater than two hundred and fifty miles, yet the difference in the appearance of all the features and vegetation of the two countries was as great as one would expect between countries lying under different zones of the earth. From the southern shores of Van Diemen's Land, in lat. 43°, to Cape York and the Cobourg Peninsula, within 11° of the line, the gum-tree (Eucalyptus of different

species) gives to the woods of Australia the same dull olive-brown and monotonous tint over the whole bar. In some of the valleys near Hobarton, indeed, and in Port Arthur, among groves of tree-ferns, which abound there under gum-trees of immense size, there is a greater resemblance to rich tropical vegetation than can be found at Port Essington, in their stunted woods of Eucalyptus, sprinkled only with a few small fan-palms, cabbage-palm, or pandanus trees. Here in Timor, on the contrary, not a gum-tree was to be seen, and even in the driest and most barren parts, on the summits of the rocky high land near the coast, some tokens of the tropics might be observed. It would have been difficult to get altogether out of sight of some noble palm, or group of cocoa-nuts, or bananas.

While admiring the beautiful view from where we sat, I managed to ask my little Malay if he had ever been in that direction, up the country, to which he replied in the negative. "I should go," I said, "if I staid here long enough;" on which he started up before me, his black eyes glistening, and with a very significant "Ah!" drew his finger across his throat. It appears, therefore, that the Malay population attach the idea of danger to penetrating the interior of the country, even a few miles. I do not think, however, that to a European, properly attended and speaking the language, there would be any thing to fear beyond the climate. Lieut. Ince, who went in a boat to the head of Coupang Bay

to-day, met with Timorese, whom his Malay attendant could not understand, but they were very civil. Mr. Sluyter, the Resident, also told Captain Blackwood that the people generally were perfectly quiet. Indeed, they cannot be a very warlike race, or the slight force the Dutch keep here would not be sufficient to guard their possessions.

On my return to the town this morning, I found the Bramble had come in. She separated from us after leaving Port Essington, and had taken a different route from ours, coming round the north side of the island. She had had only light winds all the way, and in coming down along the coast, found the charts very defective, not only in longitude, but also in latitude. Lieut. Yule informed me that her true position at noon once or twice placed the Bramble on the top of one of the mountains of the interior, as laid down in the chart. It appears, therefore, that the island is narrower than it is made on our charts, as the south coast does not seem to be so much in error, but even that is uncertain.

A Sydney whaler likewise came in. She had left Coupang a fortnight ago, and now returned to land one of her crew, a New Zealander, who was ill of the small-pox. There is a small hospital in the fort, where he would be received on payment of a certain sum. She did not anchor, but two of her men deserted from the boat, and got concealed somewhere in the town. There is a fine of one hun-

dred rupees on the master of a vessel for leaving any of his crew behind ashore; he had accordingly applied to the Dutch authorities, and the police were now after these men, for which the expense would be ten rupees a man when they were caught.

Our short stay at Coupang did not allow of any very extended examination, more especially as in these ardent climates it is impossible to work out of doors in the heat of the day. From daylight, till ten or eleven o'clock, and about an hour before sunset, is all that can with safety be devoted to exercise in the sun. I was enabled, however, to procure the following facts in the immediate neighbourhood of Coupang. The little rocky headlands on the coast, and the small cliffs bounding the valley on both sides above the town, expose beds of recent limestone. This limestone is full of corals and shells, apparently all of recent species, and is in fact nothing more or less than a raised coral reef, although belonging probably to the class called fringing reefs by Mr. Darwin, and not having any very great thickness. Indeed, about half a mile above the town, there is an exposure of subjacent rock of a totally different character, on which this coral limestone rests, having there a thickness certainly not greater than 200 feet. In general, however, it appears to form the whole surface of the country; rises behind Coupang to a height of full 600 feet above the sea, spreading over all the adjacent high lands, and giving a rather smooth and level outline

to them. Judging from this smooth outline also, it appears to stretch a long way into the interior of the country, over all the lower ridges, rising to a height, perhaps of one or two thousand feet above the sea at least, as ranges or table lands of that height are seen in the north-east strongly contrasted in their outline, with the broken and rugged hills that in the heart of the country rise probably seven or eight thousand feet above the sea. Notwithstanding this smoothness of outline, when viewed from a distance, I have no doubt that even the lower ranges are rugged enough when they come to be traversed, being broken by abrupt valleys and ravines; although the higher ground preserves a mean, regular and gentle slope from the interior towards the sea. This limestone near Coupang is dark externally, frequently very hard, but white and softer when broken open. Its surface, both that of the beds and the face of its cliffs, is rugged and full of holes, having a honeycombed appearance, and with its embedded corals, and shells, it put me exactly in mind of some of the higher portions of a coral reef, where it is permanently or commonly above the reach of the water. The beds are thick, often six feet, but irregular, and appear always in a horizontal position, or nearly so. The most common corals are mæandrina, astræa, and porites; the masses not large. They are frequently more or less crystalline when broken open, but not more so than old blocks of coral lying loose on the beach above existing fringing

coral reefs. The species struck me as quite the same I had recently seen on the coral reefs about Torres Strait. Along with the corals were embedded species of shells, the most common of which were arca, and strombus, and others, precisely as they may be seen adhering to and embedded in blocks of coral and coral rock on existing reefs. In one cliff, about half a mile from the sea, and 150 feet above it, I found a tridacna (common chama gigas of Flinders, &c.) embedded in the rock. It was two feet in length, with both valves perfect and closed, and it was evidently in the position in which it lived and died, precisely as living and dead shells of that genus may now be observed in great abundance embedded in the surface of the reefs of Torres Strait. The mass of the rock where no shells or corals were visible, was evidently made up of grains of those materials more or less minute, compacted together, precisely as the mass of a coral reef, still below water, is made up of the triturated debris of those matters. Indeed, I could arrive at no other conclusion, than that this was a raised coral reef, which spread over all the country around Coupang. If I am right in my conjecture, derived from the outline of the country of this south-west end of Timor, the central hills were formerly the only part of the island above water, and were surrounded by a fringing coral reef. As these were gradually elevated, and the neighbouring sea consequently became shoaler, this fringing reef was extended on

all sides, and portions of it were successively brought above the sea till the island attained its present condition. Slight shocks of earthquake were said to be felt even now occasionally.

Following up the valley, at a point about half a mile above the town, its sides recede a little, forming a small basin-shaped expansion; and on the western side, a small lateral valley comes down, bringing a rill of water into the main brook. At this point, some beds of red and grey shale make their appearance, containing some thin bands of a smooth compact limestone,—hard, brittle, laminated, and very different in aspect from the coral rock which still caps the banks of the valley farther back from the river. These rocks appeared only here and there, in small holes and breaks of the ground, and I could not find any section large enough to shew their dip or strike; they appeared, however, to lie nearly horizontally. They were of considerable thickness, as on a sloping ground, the summit of which was about 400 feet above the sea, they occupied the lower half of the slope down to the river. There was also a considerable mass of trap-rock, resembling the toadstone of Derbyshire in its general aspect, exhibited on both sides of the river, but not with sufficient clearness to enable me accurately to make out its relations to the surrounding rocks. On the west side it occurred at the mouth of the small lateral valley, and I could trace it nearly up to the base of the

coral limestone. The red shale was here all on one side of it, none being seen lower down the river; while on the east side the trap appeared in the bank, apparently between the shale and the coral rock, overlying the former and capped by the latter. It certainly did not appear in any way to affect or be connected with the coral rock, nor could I any where trace its actual junction with the other formation. The immediate banks of the river were obscured, not only by the thickness of the vegetation, but by huge masses of laminar and cellular travertine, frequently as light as pumice-stone, and looking like petrified froth: this was evidently deposited partly by the river itself and partly from springs and small water-courses, which probably derived their carbonate of lime from the coral-limestone above. I could not discover any organic remains in the general mass of the shale or its embedded bands of compact laminated limestone, but at one spot on the east side of the river, just opposite the mouth of the small lateral valley which comes down on the west side, I found, to my great surprise, a block of crinoidal marble, precisely resembling that of Derbyshire in every particular. This block was lying partly embedded in the soil near a footpath, not far from a hole that had been dug in the red shale. It was a rudely cuboidal mass, about two feet every way. Its lower part passed by insensible gradation into a fine-grained laminated limestone, precisely resembling the beds which were interstratified with the red shale;

but its upper part was one crystalline mass of stems of encrinites, some small, some of half an inch in diameter, broken and disjointed. I searched in vain for any head of an encrinite, but the stems are precisely like those of the mountain limestone. I did not succeed in finding the bed from which this block was detached, nor any similar bed, the bank having a gentle slope, and being much covered with debris from above; but from the aspect of its lower laminated portion, I have no doubt it belonged to the red shale formation. About a quarter of a mile farther up the brook, the valley contracts into a narrow ravine with precipitous sides, but here the only rocks exposed were cliffs of coral-limestone, with a large talus of debris at their foot. In this debris were many recent shells, among which I found one terebratula.

I must confess the facts stated above are sufficiently slender to prevent any decided inferences being drawn, and it was a source of great regret to me that time and opportunity did not allow of extending my observations; but I have little doubt that this red shale and limestone, with associated trap rocks, belongs to an old secondary formation, the substratum of the country, and it is possible its age is not greatly remote from that of the carboniferous formation of Western Europe. The trap rock may possibly be the cause of its appearance at this spot, but it would probably be found again at the surface in the neighbouring valleys or ravines, or wherever the

superincumbent layer of coral-limestone has been eaten through or denuded. As to the age of this coral-limestone, it is certainly of the newest tertiary period, even if it does not belong, by its fossils, to the recent era.*

* Since my return to England I have seen the large Dutch work, containing part of the report of the scientific commission sent to examine their East Indian dominions some years ago. In this is a geological map of the south-west end of Timor, in which the rocks around Coupang are called "Jura Kalk." If this term is applied lithologically to the tertiary rocks, it is to a certain extent applicable, as they have often a concretionary and oolitic structure, just as the stone in the limestone of Raine's Islet has. If, however, "Jura Kalk" is meant to have a chronological meaning, it is either incorrectly applied, or the formation is incorrectly extended in the map to the neighbourhood of Coupang.

CHAPTER XVI.

ASPECT OF THE SOUTH-EAST END OF SANDALWOOD ISLAND—ALASS STRAIT—CHARACTER OF THE SHORES OF SUMBAWA AND LOMBOCK—LOMBOCK PEAK—APPROACH TO THE STRAIT OF MADURA—ASPECT OF MADURA AND JAVA—SOURABAYA, ITS EXTENT AND GENERAL ASPECT—MONETARY AFFAIRS—ANECDOTES OF THE PEOPLE—EXCURSION TO GRISSEK—HIRE A HOUSE—KINDNESS OF THE RESIDENT—PREPARATION FOR A TOUR—VARIED POPULATION OF THE TOWN.

On *October* 3, 1844, we left Port Essington, on our way to Java to refit. We had very light winds for several days; on the 9th passed through Rottee Straits, and next day saw the island of Savu some miles to the southward. On October 11, lights were seen ahead early in the morning, and at daybreak we saw Sandalwood Island, or Jeendana, before us, and passed round its south-eastern extremity at a distance of four or five miles. The land here was lofty, rugged, and bare looking. Ranges of hills rose immediately from the sea to a height of about 2,000 feet; they were serrated at top, and their sides furrowed by gullies and ravines, reminding us somewhat of the south coast of Madeira. Towards the N.E. the land sank lower, and became more level. A small but steep and lofty island appeared ahead

or west of us, about five miles from the shore, opposite which the coast curved in a little, and one or two narrow but fertile-looking valleys came down from among the hills, and opened out upon the sea. Cocoa-nuts and other palm-trees were visible on the lower grounds, or crowning some of the small crags and promontories, and the scenery of these valleys seemed very beautiful. A prahu came out from the shore behind the island, and proceeded on a wind towards the east-ward.

Although the hills were so rugged and broken, the rocks of which they were composed appeared to be regularly stratified, and to lie in a nearly horizontal position. All the beds exposed were of a white colour, and seemed thick and homogeneous. They were plainly visible in the face of the precipices, both at the base and at the summit of the hills, and must form a very thick mass, not less indeed than 2,000 feet.* As we proceeded alongshore a mass of hills of a much greater elevation became dimly visible through the clouds towards the N.W., in the interior of the island. In the afternoon, after passing the lofty little island, the base of which was fringed here and there with cocoa-nuts, we found another flat sandy island beyond it, covered with low bushes, and surrounded by a reef, apparently of coral, with a ring of breakers.

* Beds of a similar appearance I afterwards saw in the island of Madura, and found them to be a white limestone, composed chiefly of coral detritus.

A little beyond this the coast trended rapidly away to the N.W. beyond our vision, its outline being very different from that laid down in the chart. So little, indeed, does the island appear to have been surveyed, that not only its form but its size varies in different charts, to the extent of one-half. Horsburgh making it nearly as large again as it is in Flinders's general chart of Australia, published by the Admiralty.

We saw smoke rising from several parts of the land, as if the woods were being burnt for clearing and cultivation. From the little we saw, it appears to be a very fine island. It is, however, almost totally unknown, and its inhabitants have the character of ferocity given them by their neighbours, though, probably, in a great measure undeservedly.

In the following year, Mr. Evans was told by the master of an American whaler, whom we met in Alass Strait, that having been shipwrecked, and found his way to Coupang, in Timor, he was taken to Batavia by a Dutch brig. That on their way they lay, together with a schooner, for nearly a month in Paddeway Bay, on the north side of Sandalwood Island. He said that it was rather difficult to make out the entrance of the bay from the outside, but that when entered it was found to be a perfectly land-locked harbour, five miles in diameter, with ten fathoms nearly all over it, and no hidden danger; that the inhabitants were very friendly and civil,

and all kinds of refreshments were in abundance; that they traded freely for muskets and cloth, and that the vessels took away 180 excellent small horses or ponies. This happened in 1842.

Having left Sandalwood Island, we had light winds for the two following days, but about noon of the 14th, we entered the Strait of Alass. As we approached it we could see the high land of Sumbawa on our right, almost entirely enveloped in clouds, while on our left was the lower and nearly level land of Lombock. The south-east end of the latter island is bounded by small perpendicular cliffs, behind which the land is gently undulating, rising into ridges of about four or five hundred feet above the sea. The cliffs are white at the base, capped by a stratum of brownish rock; in the white part, the stratification was not perceptible, but its upper surface was level and horizontal, and the brown rock upon it was regularly and horizontally stratified in thin beds. It looked just like gravel or crag resting upon chalk. The opposite coast of Sumbawa rose in steep and broken precipices to a height of at least 2,000 feet; still loftier hills in the interior, peering dimly out here and there through the clouds that lowered about them. Narrow and abrupt ravines traversed these rugged-looking hills; but even here all the rocks appeared to be regularly stratified, and the sides of the ravines shewed a continuous and conformable thickness of beds from top to bottom, inclined generally at no great angle,

although here and there, over small spaces, broken, contorted, or dipping rapidly in different directions. The materials of these beds were generally dark grey, but there were some beds of a lighter colour, sometimes nearly white, and they all had a great regularity and persistency, as if of aqueous origin. Even if composed of volcanic materials, they must, I think, have been deposited beneath the sea.

A very strong current ran through this strait towards the north, sweeping us with great rapidity, adding at least four knots an hour to our speed. The Sumbawa shore had the same character throughout—lofty and broken, furrowed by dark ravines, with strange crags and rocky precipices, and though covered here and there with woods, especially at the foot of the hills, we could make out no sign of cultivation or human residence. There is, however, a town called Alass on that side, about the centre of the strait, at which, it is said, passing vessels can procure abundance of refreshments at a very reasonable rate.

On the Lombock side, a dark-looking beach, with a few black crags, succeeded to the white cliffs; but a thick and rich-looking vegetation clothed the rising ground behind it and concealed the houses from our sight. We saw a prahu or two at anchor, off the spot where the town of Bali Laboăadjee is marked in the chart; but passed too rapidly and at too great a distance to discern much of the character of the country. The ground still continued rather low

and gently undulating, till we approached the northern end of the strait, when it gradually rose, and with a regular bold curve swelled upwards on all sides into a noble pile of mountain, the shoulders of which were completely hidden by a dense curtain of cloud. Immediately behind the beach was a line of feathery cocoa-nuts, over which green-topped knolls began to appear rising out of thick woods; and the broad slope beyond was chequered with dark forests and large green open spaces like cultivated fields. At a height of some four thousand feet, this beautiful slope disappeared in the clouds that stretched out from it over our heads in broad level sheets, with a perfectly smooth surface beneath, but undulating above, so as here to be thick and heavy, there light and thin, or altogether broken through. From these holes in the clouds, spots of sunlight fell here and there upon the slope, varying frequently in form and position, and every variety of shadow was cast upon the ground, as the clouds above slowly shifted their places and wheeled around the mountain. This scene was so very beautiful, that I could hardly think of anything else; but when we got fairly out of the strait to the northward, I looked out for the famous volcano of Tomboro, about sixty miles to the eastward, but it was too hazy in that direction to allow it to be visible. This was about five o'clock in the afternoon; and as the sun sank towards the horizon, the clouds about Lombock Peak likewise descended, and we had shortly the

satisfaction to see its summit, the delicate blue outline of which now appeared high above them, soaring as it were in the upper air. It was about twenty miles from us, in a straight line, and rose more than 11,000 feet above the sea. As the sun sank, it became more distinct, and the clouds settled down more and more, hiding themselves in the valleys and ravines, and allowing the crests of the lower but nearer ridges to emerge. We were now on the northern side of the mountain, where it rises abruptly from the sea; and here ridge after ridge successively appeared, rough with crags, and broken by narrow gullies, and separated apparently from each other by deep valleys of some width, in which we saw the tops of the clouds still boiling and rolling about. On the nearest ridges, we could make out rows of noble trees, looking like pines.* As we came out of the strait, we had a fine southerly fresh breeze, before which we were running at ten knots an hour; but on hauling up to the north-west, we passed suddenly into a broad tract of smooth water, that stretched out for some miles under the lee of the mountain; and soon after entering this, we lay with hardly a breath of wind. Three large prahus were in sight at sunset; and soon after dark we floated past them. They were steering to the eastward, being probably bound to Bima, in Sumbawa.

* These were probably Casuarina, such as we afterwards saw on the mountains of Java.

October 15.—At sunrise, this morning, Lombock Peak and the high lands about it were still plainly visible, while in the S.W. was an almost equally fine mountain in the island of Bali, called Bali Peak,* which, according to the Dutch, is likewise over 11,000 feet in height. As the sun got up, however, both these fine mountains became invisible in the hot haze.

October 16.—At daylight we were off Cape Sedāno, a place famous for pirates and tigers, over which was a fine mass of hills, 4,600 feet high. All the way from Alass Strait to Sourabaya, it was commonly calm at midday and midnight, with land or sea-breezes morning and evening. This afternoon we sounded in 55 fathoms, and brought up some fine green mud, with black specks, all of which effervesced strongly with acids, appearing wholly calcareous.

October 17.—It was again quite calm this morning, and we found ourselves floating off Pulo Gilling Antang, with several boats and prahus of curious rig and construction, either rowing, or trimming their mat sails to slight puffs of air. Some of them appeared to be fishing, others crossing between Java and Madura. We saw two square-rigged vessels at anchor off Sumĕnap, on the eastern end of Madūra, which place appeared low in comparison with the mountainous land of Java. It had, however, a range

* The native name is Carang Assam.

of hills in the interior, rising to a height of about 1,000 or 1,500 feet. These had a very peculiar outline, seldom peaked, but excessively rugged-looking, with square blocks and jagged precipices in all directions. These hills were bare and brown, except the precipices, which were as white as chalk : and the country had rather a barren appearance, except near the coast, where a rich belt of tropical vegetation seemed to encircle the island. On the Java side we could dimly see through the haze the outline of mountains, varying from four to ten or twelve thousand feet in height. At noon we anchored, having drifted near to a small island off the Madūra shore, called Pulo Gilla Rajah, and when the ship's company had had their dinner, Captain Blackwood and I landed on it. We passed over a small fringing coral reef to a sandy beach, on which great numbers of canoes were lying. Behind the beach was a row of cocoa-nut trees, under which we could see some cottages. A lot of half-naked children were gazing at us from behind the trees, who, as we approached them, ran away laughing, and we followed them along a footpath which led us to a cottage built of bamboo. Here some men and women received us very civilly, and we made them understand by signs that we wanted to buy some fowls and cocoa-nuts. A small path ran along the island about a hundred yards behind the beach, through a succession of plots of ground, divided from each other by lines of stones or low

walls. Each plot appeared carefully cultivated, and had a bamboo house in the centre. From the path the ground rose gently towards the interior for about eighty yards, when it was capped by a little escarpment, above which was a flat of cultivated ground and another group of houses. This plateau was about sixty feet above the sea, but towards the east the island rose higher. Not a block of stone could be seen but coral and coral rock. The fences were formed of blocks of old mæandrina and astræa; whether brought from the present coral reef or out of the ground, I could not learn; but in the escarpment were many large masses of coral, apparently in situ, and the rock beside them was evidently a coral conglomerate formed beneath the sea; and I should think all the corals were of existing species, and recently elevated, geologically speaking.

The people were short and stout, but not ill-looking, and many of the children, especially the boys, were really handsome, with dark eyes and roguish countenances, apparently full of fun. The people seemed very industrious and comfortable. The women, decently dressed, were pounding rice under the shade of the trees. The men wore only wrappers round their waists, and seemed not so well employed as the women, though some were building a prahu, and they were all, probably, fishermen. We had some difficulty in bargaining with them, as we none of us, as yet, spoke Malay, and there seemed

to be no head man among them. Each brought one or two fowls or a bunch of cocoa-nuts, for which he wanted a piece of money, and as they had no change, and did not seem inclined to combine their stock and share the proceeds, we found it rather a dear market. Had we brought a few red handkerchiefs ashore, or similar articles, they would have been more valued than all our dollars. As a light breeze sprang up soon after we landed, we did not remain long, but went off and got under weigh.

October 18.—The light breeze had gradually floated us up off a place on the Java shore, called Jati in the chart, and at daylight we found ourselves surrounded by a multitude of fishing-boats and prahus in all directions. The shore was flat near the sea, and so thickly vegetated with groves of cocoa-nuts and other trees, that we could see no habitations, except a row of bamboo huts here and there, built on piles, and projecting over the water. About eight o'clock we perceived through the haze two ships at anchor, and steered down for them. They were off a place called Passarouàn, where pilots are taken on board for the strait of Madura, or Kerībi, as they were formerly called. We sent a boat on board one of the vessels, when a Dutchman, who spoke English, informed us there was no pilot there then, but we should find one on board one of two vessels that we now saw coming down out of the strait toward us. We could see over the trees the red tiled roof of some building, with a flagstaff and

a pigeon-house-shaped place, probably a look-out or signal station, but had no idea that Passarouàn was so considerable a place as we afterwards found it. Lofty mountains rose at the back of it, the finest of which is Arjuno, a conical mass, 11,900 feet in height. We now stood to the north for the mouth of the strait, out of which we saw a large Dutch man-of-war steamer proceeding to the eastward, probably in search of pirates. We received a pilot from one of the vessels, which were coming down from Sourabaya to Passarouàn to complete their lading. He was a young half caste, but spoke English pretty well. Under his direction, we steered N. by E. till within three miles of the Madura shore, when, as it got dark, and we were in only 17 feet water, we anchored for the night. The pilot said there were some "stones" farther on, for avoiding which he could not see the marks except by daylight.

October 19.—We weighed at daylight, but were shortly obliged to anchor again till the tide rose, as we stuck in the soft mud. We then floated quietly up, but did not reach the roads till noon. The Madura shore continued to shew the same characters as before, a belt of the richest tropical vegetation, with small white cliffs and perpendicular rocks appearing over it here and there. The Java shore was excessively flat, and bordered by extensive mangrove swamps. As we approached the anchorage, we saw rows of fishing-stakes, projecting often half-

way across the strait, with many boats and prahus, and a considerable number of square-rigged vessels at anchor, among which were an old sloop-of-war, two steamers, and a schooner or two, belonging to the Dutch navy. As soon as we had anchored, several naval officers came on board of us, some of whom spoke English, and all were remarkably polite and attentive. We could still see nothing of the town of Sourabaya, except a tower or two, and here and there the roof of a house and a flagstaff over the trees, in front of which were extensive mud-flats, dry at low water. A kind of pier projected from these into the anchorage, to which we were directed to proceed when we wished to land. About two o'clock, Captain Blackwood, Mr. Bell, and myself, went away in the first gig, but on coming to the pier-head, found it enclosed a canal, and the tide being out, we grounded on a shoal. We immediately called one of the native boats, of which there were many about, and transferred ourselves to it. These boats are flat-bottomed, with a broad seat and awning for passengers, propelled by two men, or boys, with paddles in the bows, and steered by another in the stern. As soon as we entered the canal, the two boys landed on the right hand pier, and fastening a tow-rope to the head of a short mast, or stanchion, proceeded to track us up. This canal is the mouth of the Kediri river, or at least one of its principal branches, called the Kali mas, or Golden Channel. It is carried out by means of two

piers formed of piles and earth, and partly faced with stone for about a mile and a quarter, to the verge of the deep water in the strait. It is about 40 yards wide, and 2 or 3 feet deep, at low water, when it is fresh, with a strong current. At high water the current is barely checked, and it is then 6 or 8 feet deep. It was crowded with boats, large and small, laden with rice and other commodities, and a Chinese junk, and two or three schooners lay on one side of it under repair. About half way up there is a house and a flag-staff on the right hand side as you approach the town, which is a kind of post for the custom-house and police officers. This place is called the "boom," as there probably was a boom formerly across the river. We were directed to land here to enter our vessel's name, and our own, in a register, and to be made acquainted with the port regulations. They were pretty civil to us, though apparently not used to the presence of foreign men-of-war, and began to talk about opium, which is a prohibited cargo. As soon, however, as they knew who we were, they never gave us any more trouble, though all country boats have to wait till entered and examined by a custom-house officer before they can proceed.

On approaching the town we passed a large new stone fort or citadel on the left hand side. There were still many men at work throwing up banks of earth around it. Immediately above this the road on each side of the canal became much wider, and

was sheltered by a row of trees, behind which were houses, some of them of a good size and appearance, and inhabited by Europeans, others smaller, belonging to natives, or half-castes. We shortly afterwards came to some steps, where the roads diverged on each side from the river, and where we were told to land on the right hand side. Here was a large building called the Waterhuis, where the water of the river is filtered on a large scale, and supplied to shipping by a floating tank, at a reasonable rate. Turning up a narrow street, we passed the hotel without knowing it, and proceeded between some white walls, enclosing the naval arsenal and other public buildings, with an occasional row of trees on each hand. We then reached a kind of square, in which was a church, and inquired our way to Mr. Fraser's, who, we understood, was the principal English merchant. We here came again on the river, over which was a large wooden bridge, leading to the Chinese quarter. Above the bridge, shaded by a fine row of tamarind-trees, were a number of large houses and stores, where the principal merchants had their offices. As it was now nearly four o'clock, we found Mr. Fraser had gone out to his country-house, to which Captain Blackwood proceeded, while Mr. Bell and I returned to the hotel. Here we found a very fair table d'hôte, where were several Dutch officers, and other young men, and one or two ladies. After dinner we procured a carriage, a kind of old calêche, drawn by two ponies, and drove round the town,

but it got dark too soon to see much. The town seemed very extensive, and its suburbs still more so. We drove up one road and down another for several miles, under avenues of trees, with native villages or kampongs on each side of us, interrupted here and there by the country-houses and grounds of Europeans. Many of these latter seemed pretty spacious, and all were thrown open, and lighted up with many lamps. In front of these houses were parties of ladies and gentlemen sitting in verandahs and porticos, taking tea or wine, smoking or playing cards, and chatting. We met one or two carriages of ladies, seemingly in full dress, without bonnets or any head-dress, driving about in the cool of the evening. We crossed the river, which now seemed rapid and winding, and had several wooden bridges over it, and after driving down some dark roads, overshadowed by trees, in which brilliant fire-flies were flitting about, entered the town again by the Chinese quarter. Here we found grotesque-looking houses, lit up with large paper lanterns, of gaudy colours, with Chinese inscriptions or monsters upon them, and long rows of Chinese characters up and down the door-posts, or over the windows. Large arched gateways seemed to lead into some of the streets, probably particular quarters. Crowds of people swarmed along the streets, and strange cries and a babel of languages resounded in our ears, and every variety of eastern dress flitted about us, from the half-naked coolie to the well-clothed Chinese, in a loose white jacket like a dressing-

gown; the Arab merchant, in his flowing robes, or the Javanese gentleman, or gentleman's servant, in smart jacket and trowsers, sash, and sarong or petticoat, a curious penthouse-like hat or shade, and a strange-handled kriss stuck in his girdle. It was a novel and exciting scene, but, used as we had been lately to quiet and seclusion, rather bewildering, and we were glad about eight o'clock to retreat to the hotel, and thence to take boat and get on board the ship. In going down the canal we were stopped at the boom to say who we were, and to pay two fanams, or about $2\frac{3}{4}d.$ This was said to be a regulation adopted for the security of passengers, as in former times men going on board ship at night had been taken by native boatmen into the strait, and never heard of again. Now each of these boats is numbered and licensed, and the head man of each known. Both the boat and head man of it (owner or hirer, as the case may be) are called "tambangan," but which took the name from the other I cannot tell. The two fanams are exacted from each boat going outwards after 6 P.M. The three following days I employed in rambling about the town and neighbourhood. The country around is flat and marshy, and intersected by large ditches or drains. It is cultivated with rice, Indian corn, and sugar-cane. The roads are good—raised generally about four or five feet above the level of the fields, and lined with rows of trees, that sometimes arch completely overhead. There were several

English residents, with some of whom we gradually became acquainted. We had much trouble and annoyance in pecuniary matters, from the disordered and peculiar state of the currency. This was silver, paper, and copper. The smallest coin is the doit or duit, one hundred of which are called a copper rupee, and one hundred and twenty a silver rupee. The bank of Java had notes in circulation of five, ten, twenty-five, &c. rupees. There were notes of the smaller denomination, both in silver and copper rupees;* but the larger notes, those for twenty-five or fifty rupees, or more, were I believe always silver. The silver coinage was guilders, half guilders, and quarters, as also three-guilder-pieces. Spanish dollars also would pass. Originally, I believe, the silver guilder was worth a silver rupee, or 120 doits; and the bank note for 25 silver rupees was worth 25 guilders, which indeed are always called rupees in Java. At so great a discount, however, was now the bank paper, or rather, at so high a premium was silver specie, that it was rarely or never seen; and the highest exchange we could get in silver coin for a 25 silver rupee note was 19½ rupees, and sometimes not so much. The consequence was, there were now three kinds of rupees,—copper rupees, silver-paper rupees, and

* I have since been informed, that the copper paper-money (recipissen) was not issued by the bank of Java, but by the Government. It has, I believe, since been called in, and a new issue made on a better footing.

silver-specie rupees. In dealing with Chinese or natives, copper rupees were commonly understood to be used; with European merchants or shopkeepers, silver paper in most cases, but sometimes after the bargain was concluded, it was insisted that silver specie was understood. As no one would ever change a note in silver, and as if you took it in copper, you were obliged to get a coolie to carry it, all business was carried on by bills or orders; and we were recommended to establish a credit with some merchant, and send orders to him to pay for any articles we might happen to purchase. The present rates of exchange were as follows:—

Doits.		
100	=	1 copper rupee.
120	=	1 silver-paper rupee.
160	=	1 silver-specie rupee.
400	=	1 Spanish dollar.
1740	=	1 pound sterling.

From this it resulted, that one English shilling was worth 87 doits, and that in one pound sterling, there were $10\frac{7}{8}$ specie rupees, $14\frac{1}{2}$ silver-paper rupees, and $17\frac{2}{3}$ copper rupees; that $7\frac{1}{4}$ doits were worth 1*d.* sterling, and therefore one copper rupee equalled rather more than $13\frac{3}{4}d.$, a silver-paper rupee rather more than $16\frac{1}{2}d.$, and a silver-specie rupee rather more than $22d.$ In reckoning with natives, the copper rupee was also divisible into ten nominal coins called fanams, each worth 10 doits, or rather more than $1\frac{3}{8}d.$

The cause of the depreciation of bank paper in regard to silver coin, or the high rate of silver, both

as regards the paper and copper currency, was said to be in great measure the act of the Government. This was said, in the one case, to derive a much greater profit from the copper coinage than from that of silver, by keeping the real worth of a copper doit below its nominal value. In the other case, that of the bank paper, I was informed, that on the institution of the bank of Java, the Government caused all its officers to take shares in it, by making each one give in his securities on entering office in those bank-shares; and that, on the bank becoming embarrassed, it had made its notes a legal tender, in order that the shares might not be depreciated. At all events, an act of Government passed, exonerating the bank from all liability to cash its notes, and disabling any one from demanding from the bank payment in silver for the notes he held. How the bank became embarrassed, I did not learn; but, independent of general commercial arrangements, it seemed to have suffered losses by peculation, as one of its managers of the branch in Sourabaya, was at the present time in gaol in consequence of defalcations to a large amount. This person had built a handsome mansion on one side of the town. This house was now occupied by a society called Concordia,—a kind of club with billiard tables, magazines, and reading room, and a department for eating and drinking. Of this we were invited to be honorary members. There was also a book club among the English residents, where we got a sight of several new publications and periodicals.

Mr. Fraser was kind enough to give us a general invitation to his house in the country. This was about two and a half miles from town, near the river. Like most of the country houses, it was long and low, consisting of one storey only. It had one principal room, in the centre of the house, opening both before and behind, by two large doorways, into spacious verandahs or porticos, as large as the room itself, and supported by pillars. Each of the wings was occupied by three good bed-rooms. It stood in an enclosure of about an acre, with lawn, coach-house, stable, and servants' houses and offices. Such are most of the Dutch houses, varying chiefly in size, with the same general arrangement. The floors are tiles covered with cane matting, in the principal room. As soon as it gets dusk, the central saloon is lighted up with many lamps, the doors and windows still remaining open, and every now and then a carriage drives up, some acquaintance drops in for an hour or two, joins the dinner table if he have not dined, or smokes his cigar if he have, and drives away again. The English dine usually at six or seven, but the Dutch much earlier. This circumstance, and some other differences in their habits or manners, seems to keep their society pretty distinct. They do not often mingle, except on public or stated occasions. Without any open expression of dislike, there does not seem any great cordiality between the two nations, or rather between those who are resident, for we, as

strangers, were always treated in the most friendly manner.

The first time I dined with Mr. Fraser I met Mr. Jeekel the assistant-resident, the naval commandant, who, with the rank of post captain, is invariably styled Colonel, according to the continental mode of taking the army as the standard of rank, and Mr. M'Clelland, a Scotchman. The latter gentleman has a history not a little singular, and as he has already appeared in print, I may be excused for mentioning it. He is the individual mentioned in Washington Irving's Astoria, who, on the return of the party overland, left the rest of his comrades and pushed on ahead by himself across the Rocky Mountains. After leaving North America, he went to China, and then came to Java, where, by industry, prudence, and energy, he has gradually accumulated an ample fortune. He now owns a large ship-yard in Sourabaya, and a foundry near Passarouan, at which town he generally resides. Several anecdotes were related illustrative of the Javanese character. They were described, generally, as an excellent race of people, patient, good tempered, and very handy and ingenious. A man who is one day a carpenter, will turn blacksmith the next; or from a cultivator of the ground, will become a sailor. They are fond also of change, and the Colonel told us a story of a servant of his, who, after living with him for several years as a coachman, begged one day to be allowed to go on board ship and be a

sailor. Surprised at this, his master asked him what was his reason, whether he had any complaint to make, or was in any way dissatisfied? "No," he said, "he had nothing to complain of, but he was tired of seeing the Colonel's face every day."

As we sat after dinner I heard a continued sound of resonant thumping, like the beating of tomtoms at a distance, and at length inquired what it could be, when I found it was merely the everlasting beating of rice in the rice-troughs, in order to separate the grain from the husk, at all the native houses in the neighbourhood. The thumping seemed to assume a regular measure, and I understood that it was capable of being turned to account, as a means of transmitting intelligence. There is a peculiar measure which is universally known as a signal of alarm, and in times of commotion, if once set a going, would be taken up in every direction, and spread over the whole country with the greatest possible rapidity.

As I understood we should only remain in Sourabaya a few days, I wished to go across to Madura, but found that I could not be permitted even to land on the Madura shore, although our vessel lay within a mile and a half of it. In order to be allowed to land there, it was necessary first to get an invitation from the Sultan of Bankālang, and then to get permission from the Resident of Sourabaya to accept it. As, however, I heard of some caves in limestone, at a place called Grissek, about eight miles

along the Java shore, towards the north-west, I determined to visit them, especially as they were said to be inhabited by the swallow that makes the edible nest.

On the morning of the 23rd I went in a tambangan down to Grissek. It was at first calm, and the tide against us, obliging us to pull up in the shoal water across large mud flats. Lines of upright posts traversed these in several directions, with cross pieces from one to the other. The posts were bamboos, which, from their motion, seemed only to be moored with a weight at the bottom. They were in some way connected with the fishery, but how they were used, unless it was to dry the nets on, or merely as boundary marks, I could not make out.

As we neared Grissek, a very shoal bay, bordered with mangroves, seemed to run in on the Java side, and mangrove flats also appeared at the end of Madura; but at Grissek itself commenced a small range of hills, some three or four hundred feet in height. Near the town the shore began to be bordered by houses, of which one, seemingly a large and handsome one, belonged to a Chinese merchant. It was eleven o'clock before we reached the pier at Grissek, where I landed, and walking into the town, inquired for the assistant-resident, M. Kurchinnus, to whom Mr. Fraser had given me a letter. To my regret, however, I found he had gone to Sourabaya, and I now was puzzled how to pro-

ceed. I managed, however, to recollect the words "orang Ingries" (Englishman), which being put in a tone of inquiry, was answered in the affirmative, and I was immediately conducted to a house belonging to Mr. Dean, an Englishman. He also was away, but a young Dutchman in his employ spoke English, and having understood what I wanted, sent for a carriage and horses for me, and directed the driver to take me to the caverns and bring me back again.

Grissek seemed rather a pretty town, the principal street lined with two rows of very fine tamarind-trees and very fair houses. A number of brigs and schooners, and prahus and small country vessels, lay off the pier, near which was a building-yard belonging to Mr. Dean. My carriage was like those of Sourabaya, with four small horses or ponies, driven in hand by a Javanese, with another man hanging on behind, whose office it was to run forward occasionally and flog the leaders. Sami, also, my tambangan, perched himself behind the carriage, and I could hear him explaining to the other's inquiries, that I was an English colonel, belonging to the "kapal prang," or war ship. We drove through a back part of the town, principally occupied by native houses, made of bamboo, and then got upon the great mail road, which runs from Sourabaya to Batavia, or even from Banyu Wangy, at one end of the island, to Anjer at the other, a distance by the road of between seven and eight

hundred miles.* This road was a very good one: broad, straight, level, and well made. It ran across a flat between the low hills and the sea. Just out of the town I passed a native party, consisting of a man on horseback in a gay dress, his face, neck, and hands smeared over with a yellow paste: one attendant held a large painted and gilt umbrella over him, while two preceded with a blue banner, and several followed in handsome dresses and ornamented krisses. I believe he was a bridegroom of rank, going in procession to his bride. About three miles from Grissek we turned up a cross road to the left, and ascended a low hill, where the ground became rocky; and in another mile or so stopped under a large shed or alcove, that stretched across the road. Here I was requested to alight, and a man coming from a neighbouring kampong conducted me to the caverns. The rock of these small hills was in many places bare, and its weathered aspect looked exactly like coral rock, and like many parts of a coral reef when left dry. It was rough, dark-brown, and much honey-combed, externally. I could not, however, find so much as a single piece of coral any where, nor could I trace any organic structure in any part of the rock. On the top of the first low hill I found a large, square, open shed

* The extreme length of the island of Java, in a straight line, is 660 statute miles; its greatest breadth 130; its least 38, where we crossed it; and its mean breadth between 80 and 90 miles.

or alcove, with a brick floor and stone steps, and wooden pillars and roof. From this there was a fine view of the neighbourhood. It appeared that the mass of hills I was upon was a continuation of one of the ranges of Madura, having the same height and general appearance. It is separated from that island by the strait, and seems formerly to have been itself an island, since it is every where surrounded by flat marshy land, and many mangrove swamps.

The hills are about three hundred and fifty feet high, have an escarpment towards the north, and the beds at the limestone caverns dip slightly south-west. I found these caverns were artificial, being, in fact, merely galleries formed by following along the dip several beds of a white, soft, but gritty lime-stone, which is found to make excellent drip-stones, and has also been used for building. Some of the beds had a concretionary structure; others were made of grains compacted together: both these resembled beds which we had found on Raine's Islet. It appears to harden in the air, as, although many of the beds were quite soft and friable in the roof and sides of the caverns, parts of the same lying loose, as well as fragments outside, and most of the weathered surfaces were hard, although very much corroded. In some places there were cherty pieces quite smooth and compact. Although I did not see any organic remains of any kind, I have not the least doubt that this limestone is the result of the detrition of corals,

nor that it is of some tertiary, and, I believe, modern tertiary era.

Several of the swallows were flying in and out of the caverns, but I did not see any of the nests at this visit. There were many bats also in the caverns. Saltpetre is made from the soil which is dug out of the floor of these recesses, the result, probably, of the droppings of the bats and birds. After looking over the caverns, I returned to Grissek.

I was much struck, not only with the goodness of the roads, but with the neat and clean appearance of the houses and fences, and the apparently comfortable condition of the people. At some parts of the road, where the central carriage-way was bordered by green grassy spaces, with trees arching over-head, neat fences and detached cottages, I could have fancied I was in England, had it not been for the tropical forms of the trees, the brown skins of the people, and their peculiar dresses. On my return to Grissek, I lunched on the celebrated fruit the durian; and although I had to overcome some repugnance at its scent, I really liked the fruit. Its flavour, however, is very peculiar, something like rich custard and boiled onions mixed together.

Having a fair wind and tide, we sailed back to the ship with great rapidity. The sail was a huge triangular mat spread between two bamboos, the apex of the triangle downwards. As the whole weight of the sail hangs over to leeward, the tambangan heels very much when on a wind, and for

two or three miles one of the boys was obliged to convert himself into an out-rigger to prevent its capsizing. This he did by throwing a rope over the short stanchion serving for a mast, and standing on the gunwale and holding the ends of the rope, he leant straight out to windward over the water.

On reaching the ship, I found, to my surprise as well as gratification, that we were to stay at Sourabaya instead of going on to Singapore. Captain Blackwood was moved to this determination, I believe, by the superior advantages to be obtained in the ship-yard of Mr. M'Clelland for the repairs that we required, compared with anything obtainable at Singapore. The Prince George was to go on to Singapore, both to take up the wrecked people we had brought from Torres Strait,* and to get our mails and dispatches and join us again here. As the hotel was full at present, four or five of us determined to get a small house on shore during our stay. We found much difficulty in this; and were at last obliged to put up with one in a narrow back street. It stood, however, in a small court-yard, surrounded by high walls, and had sufficient conveniences for such a temporary residence as we required. There was a long sitting-room, four bedrooms, a cook-house, and servants' house, bath-room, and a long out-house, where I could get ashore, arrange, examine and re-pack all my specimens,

* These were the crew of the Lady Gray wrecked on the Alert reefs, who came to us in Torres Strait in their boats.

which to me was a great recommendation. We paid for this house, partly furnished, fifty rupees silver a month, or about £3. 10*s*. On the first Sunday evening, we went to pay our respects to the Resident. It is the universal custom among the Dutch in the East, for the Resident or other principal authority to be, as we say, "at home" on a Sunday evening. There is no regular entertainment; but card-parties are formed, or parties for conversation, and wine and refreshments handed about. The present Resident of Sourabaya, Mr. Pietermatz, received us with great kindness; and during the whole of our stay in Java, did everything in his power to render it interesting and agreeable to us. Captain Blackwood wished to see something of the interior, and as I was equally desirous of doing so, we set about making arrangements for it. This we found a matter of some difficulty, as the interior is usually shut up against foreigners. Mr. Pietermatz at once gave us permission to go anywhere we pleased within his own residency; but beyond that his power did not extend. We had, therefore, to chalk out a route by the advice of some friends, and then to send applications to the different Residents for leave to pass through their districts, and to receive answers before we could set out on our journey. This required about ten days' delay.

The customs' regulations are rather strict; and in order to land my baggage, and especially my gun, I

found it necessary to get a pass from the Resident, and to engage that I would take it off again when I left. In this case, as in every other, we experienced the greatest courtesy and civility, not only from the Resident, but from all the officers of the Government.

I was never weary of wandering about the town, and watching the various population, reckoned at 60,000, and their manners and customs. The lower order of Javanese are a stout broad race of people, seldom above the middle height. The men, when employed in labour, have frequently nothing but a tight cloth round the loins, but at other times wear the sarong, which is a long piece of coloured cotton that wraps round the waist and hangs down to the knee; to this they sometimes added a jacket, either of cloth or cotton. The women generally wear clothes of a dark blue colour, more or less resembling a gown and petticoat, but often have the neck and shoulders naked, and the sarong or gown wrapped tight under the arm-pits and across the bosom. Both sexes wear their hair long, and turn it up with a large comb, so that at first we were often puzzled to know the men from the women at a little distance. Men, women, and children, may be seen all day long dabbling in the river, the children quite naked, and young boys are often seen walking about the town in a perfect state of nudity. The women seldom wear anything on the head; but the men have often a conical hat, of a kind of wicker-

work, of split bamboo. The higher ranks commonly wear a handkerchief wrapped round the head, in a peculiar fashion; and a Javanese gentleman in public usually wears a smart green or purple velvet or cloth jacket, with gold buttons, a shirt with gold studs, loose trowsers, and sometimes boots, and a sarong and sash, in the latter of which is always carried a large kriss, ornamented with gold and diamonds. The women of the higher classes generally live in a retired manner; but among the lower orders, they are under no restraint or seclusion, and seem indeed to be the principal frequenters of the markets. There were always fully as many women as men to be seen abroad.

The Chinese are the same plump, clean, good-tempered looking people as elsewhere, and reside at Sourabaya in very considerable numbers. They inhabit a quarter of their own, where they are in some way under the control of a head man, called the "Capitan China." The Bugis from Celebes come in considerable numbers to trade at Sourabaya, and may often be known by their wild eyes, and more bold and determined look than the Javanese. They are also under a Bugis captain, who is to a certain extent answerable for their good conduct. One of the most *outré* sights, as it appeared to me at first, was to see Chinese or Arabs in their national dress driving about in European carriages or gigs. I could hardly refrain from laughing the first time I met a corpulent Chinese gentleman, in a

white dressing-gown-looking affair, smooth head, and long pigtail, weighing down one side of a small pony gig, and driven by a smart Javanese boy, in his native dress, and a round japanned thing on his head, like a china punchbowl. This japanned punchbowl-shaped hat, by the by, seems to be almost peculiar to the coachmen.

The lower class of Chinese frequently act as pedlars. With two wicker-cases slung on a bamboo yoke, they are always to be seen traversing the town, selling drapery or cutlery, or else fruit or eatables. Towards evening many of these pedlars, both Javanese and Chinese, carry edibles, with a stove to keep them hot, and every here and there may be seen a group squatted round one of these portable kitchens, eating their suppers. Multitudes of coolies or porters are always to be got, principally Madurese, ready to carry anything, or go anywhere. You may get a little boy, with two small baskets suspended from a small bamboo, who will follow you to market, or go shopping with you, or two great stout fellows, who can carry heavy weights between them slung on a strong bamboo pole resting on their shoulders. In all the places of business you have but to shout "coolie," and you are immediately surrounded by a host of all descriptions, quarrelling for your custom. Here and there, under the shade of a tamarind-tree, may be seen seated one or two men, generally Chinese, with piles of copper money before them on mats, or little heaps of silver coin,

and these are your only money-changers, if you wish to get a note cashed. During the day all the European warehouses are thronged with these and people of other nations; and pale-faced clerks may be seen driving about in hackney carriages to the custom-house or other places of commercial resort. The river meanwhile is crowded with life. Besides the bathers, there may be seen groups of men and women washing clothes. This they perform by dipping them in the muddy water, and then banging them with their whole force against a wooden bench, one end of which is scored with grooves at right angles to each other, to produce a greater impression. Soap is seldom used, and it is singular how clean and white linen becomes under this process and with this dirty water, although, as may be imagined, its texture suffers severely. Meanwhile, boats of all sizes are constantly passing up and down, from simple canoes made of a hollow tree, to the gaily painted and curtained tambangan, or the great prahu or cargo boat, laden to the water's edge with cargoes of rice, corn, sugar, or coffee, covered in with a penthouse of mats, and propelled by men with long poles, who have a ledge to walk on outside the gunwales. Mingled with the various groups ashore, were the troops in their light blue and yellow uniform. These are a miscellaneous assemblage of many races: Javanese, Madurese, and Bugis, with genuine Negroes from the west coast of Africa, and Europeans, who are often Dutch con-

victs, or men who, to escape punishment in Holland, have volunteered for the service in Java. Their officers are either Europeans or half-castes. They have about 2,000 infantry, besides artillery and cavalry, in Sourabaya.

Nor is this mixed population by any means a silent one: the songs and cries of the boatmen on the river are mingled with the cries of the pedlars ashore, each of whom proclaims his wares aloud, as did formerly the street traders of London, while a perfect Babel of tongues and languages may be heard in the various conversations going on around.

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